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PROJECT SPECIFIC PLAN FOR PREDESIGN CHARACTERIZATION OF SEDIMENTS IN PADDYS RUN AND ASSOCIATED DRAINAGE FEATURES

DEMOLITION, SOIL AND DISPOSAL PROJECT

FERNALD CLOSURE PROJECT
FERNALD, OHIO

DECEMBER 1, 2003

U.S. DEPARTMENT OF ENERGY

20300-PSP-0013
REVISION 0
FINAL

000001

5187

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Document Number 20300-PSP-0013
Revision 0

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12/1/03

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LIST OF ACRONYMS AND ABBREVIATIONS

ALARA	as low as reasonably achievable
ASCOC	area-specific constituent of concern
ASL	analytical support level
ccpm	corrected counts per minute
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cfs	cubic feet per second
COC	constituent of concern
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
ECDC	Engineering/Construction Document Control
EPA	Environmental Protection Agency
FACTS	Fernald Analytical Computerized Tracking System
FAL	Field Activity Log
FCP	Fernald Closure Project
FRL	final remediation level
GC/MS	gas chromatograph/mass spectrograph
GFAA	graphite-furnace atomic absorption spectrometry
GPC	gas proportional counting
GPS	global positioning system
HPGe	high-purity germanium detector
HPLC	high-performance liquid chromatography
HRMS	high-resolution mass spectrometry
IC	ion chromatography
ICP/AES	inductively coupled plasma/atomic electron spectrometry
ICP/MS	inductively coupled plasma/mass spectrometry
IEMP	Integrated Environmental Monitoring Plan
LAN	Local Area Network
MDC	minimum detection concentration
mg/kg	milligrams per kilogram
OSDF	On-Site Disposal Facility
OU5	Operable Unit 5
PCBs	polychlorinated biphenyls
pCi/g	picoCuries per gram
pCi/L	picoCuries per liter
PID	photo ionization detector
PPDD	Pilot Plant Drainage Ditch
ppb	parts per billion
ppm	parts per million
PSP	Project Specific Plan
PWID	Project Waste Identification and Disposition Report

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

QA	Quality Assurance
RA	Remediation Area
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RMS	Radiation Measurement System
ROD	Record or Decision
RSS	Radiation Scanning System
RTIMP	Real-Time Instrumentation Measurement Program
RTRAK	Real-Time Radiation Tracking System
S&H	Safety and Health
SDFP	Soil and Disposal Facility Project
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SSOD	Storm Sewer Outfall Ditch
TAL	Target Analyte List
TBD	to be determined
TEF	Toxicity Equivalence Factors
V/FCN	Variance/Field Change Notice
VOA	volatile organic analysis
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this project specific plan (PSP) is to provide details of the pre-design sampling and non-intrusive characterization activities to be conducted to characterize the soils and sediments within Paddys Run, the Storm Sewer Outfall Ditch (SSOD), and the Pilot Plant Drainage Ditch (PPDD) hereafter, collectively referred to as Stream Corridors. These areas are primarily located along the western and southern side of the Fernald site (Figure 1-1). The purpose of the sampling is to determine whether contamination exists in these corridors that would exceed the Final Remediation Levels (FRLs) as specified in the Operable Unit 5 (OU5) Record of Decision (ROD). If contamination is encountered that exceeds the FRLs, the characterization data will be used to support remedial design requirements (i.e., to estimate the location and extent of contamination requiring remediation).

Characterization activities carried out under this PSP will be performed in accordance with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ), the Sitewide Excavation Plan (SEP), the Waste Acceptance Criteria (WAC) Attainment Plan for the On-Site Disposal Facility (OSDF), and Data Quality Objectives (DQO) SL-048, Revision 5 (Appendix A).

1.2 KEY PERSONNEL

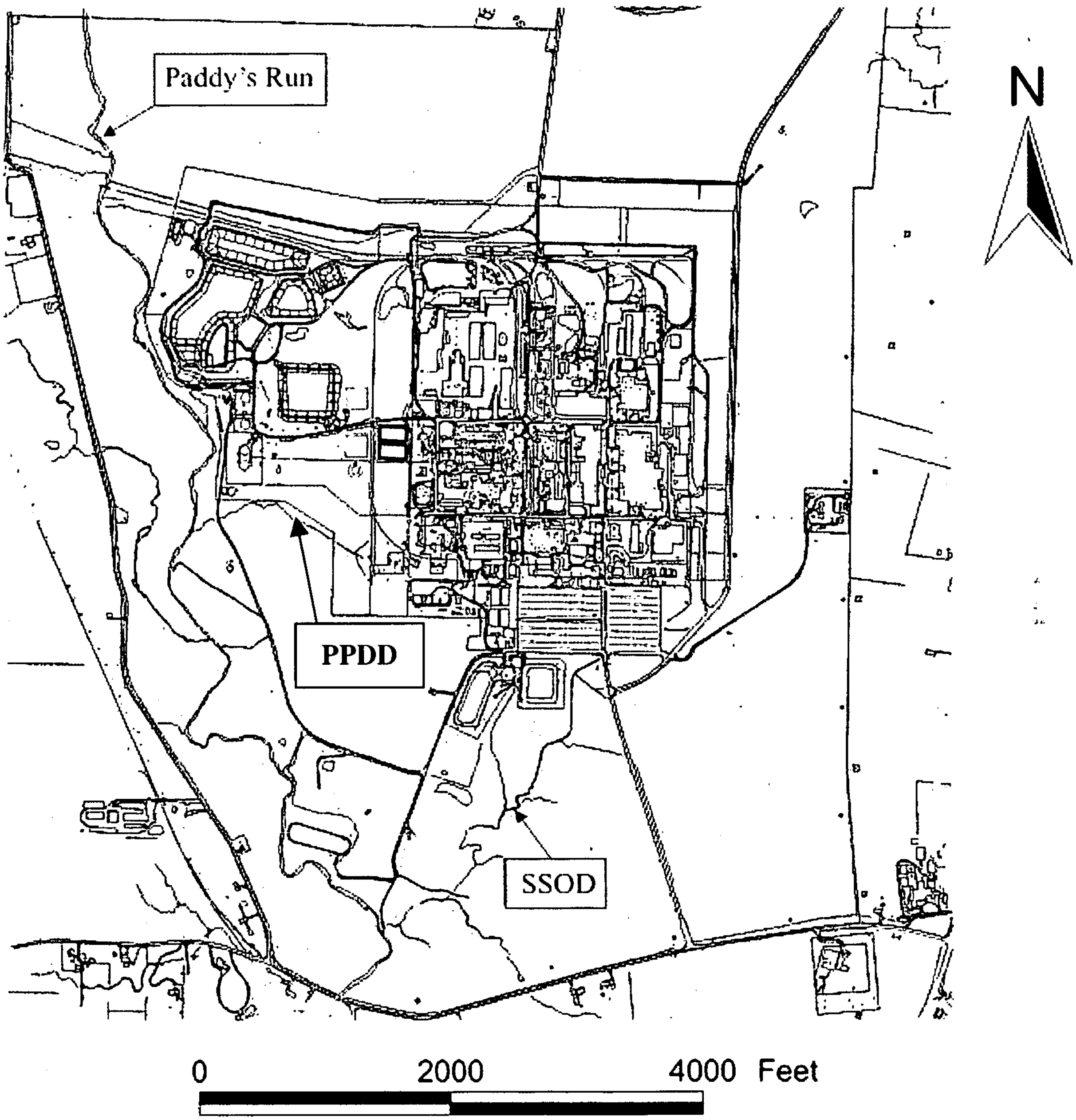
The team members responsible for coordination of work in accordance with this PSP are listed in Table 1-1.

TABLE 1-1
KEY PERSONNEL

Title	Primary	Alternate
DOE Contact	Johnny Reising	TBD
Project Manager	Jyh-Dong Chiou	Frank Miller
Characterization Manager	Frank Miller	Krista Flaugh
Characterization Lead	Krista Flaugh	Denise Arico
RTIMP Lead	Brian McDaniel	Dale Seiller
Field Sampling Manager	Tom Buhrlage	Jim Hey
Surveying Manager	Jim Schwing	Andy Clinton
WAO Contact	Linda Barlow	TBD
Laboratory Contact	Heather Medley	Kathy Leslie
Data Validation Contact	Jim Chambers	Andrew Sandfoss
Field Data Validation Contact	Dee Dee Edwards	Andy Sandfoss
Data Management Lead	Krista Flaugh	Denise Arico
Radiological Control Contact	Corey Fabricante	TBD
FACTS/SED Database Contact	Kym Lockard	Susan Marsh
Quality Assurance Contact	Reinhard Friske	Frank Thompson
Safety and Health Contact	Gregg Johnson	Jeff Middaugh

FACTS – Fernald Analytical Computerized Tracking System
RTIMP – Real-Time Instrumentation Measurement Program
SED – Sitewide Environmental Database
TBD – to be determined
WAO – Waste Acceptance Organization

FIGURE 1-1. LOCATION OF PADDYS RUN, SSOD AND PPDD



2.0 PREDESIGN CHARACTERIZATION OF SEDIMENT AND SOIL IN PADDYS RUN AND ASSOCIATED DRAINAGE FEATURES

2.1 BACKGROUND

The area of concern addressed by this PSP includes the soils and sediments that fall within Paddys Run, the SSOD, and the PPDD. The current location of Paddys Run is shown in Figure 1-1. Paddys Run runs approximately north-south along the western edge of the site. The length of the riverbed on-site is approximately two miles. Paddy Run's flow is highly variable, ranging from nearly dry conditions some summers up to 500 cubic feet per second (cfs). Historically, it has received drainage from all but the extreme northeastern corner of the site. Since the mid-1980s, drainage from the most contaminated areas of the site has been controlled by diverting it to lined storage basins, where the water is stored before treatment in the Advanced Waste Waster Treatment Facility.

The SSOD is the principal tributary on-site for Paddys Run. Uncontrolled (and potentially contaminated) run-off from the main parking lot and eastern areas of the site enters this drainage ditch at the extreme northeastern fork. The northwestern fork periodically receives contaminated run-off from the site's Storm Water Retention Basin during overflow events.

The PPDD is another tributary to Paddys Run. It is located on the boundary between Area 2 Phase II and Area 7 south of the silos and their associated remediation facilities. It spans from the western edge of the Former Production Area, just west of the Former Pilot Plant, over to Paddys Run. It enters Paddys Run southwest of Silo 1. The PPDD has been identified as a source of contamination into the aquifer. As such, samples were collected under the Project Specific Plan for Predesign Sampling in the Area 2, Phase II – Parts Two and Three, Revision 0, Final, October 1999. The results of these samples indicate that elevated levels of uranium are present at the surface. Further predesign data still needs to be collected to determine the extent of contamination from the other area specific constituents of concern (ASCOCs).

The on-site portion of Paddys Run's streambed primarily consists of gravel mixed with sand combined with transitory channel deposits, typical of coarse bed-load materials. The streambed is at significant depth relative to its banks, with bank heights ranging from 10 feet along the southwestern bank to more than 30 feet along the northeastern bank. The western bank is, in general, much lower than the eastern bank. The area immediately west of the stream represents an over bank flood plain. The width of average flow within the streambed is approximately 20 feet.

This stretch of Paddys Run is actively degrading with incisive meanders. High flow events can be accompanied by significant streambed reworking and bank erosion. As an example, between 1954 and 2000, the centerline of Paddys Run moved approximately 40 feet closer to the silos, cutting into the bank that borders the western edge of the silos area. The course of Paddys Run has also been modified by human intervention during the years Fernald was active. These include bank stabilization measures along the eastern bank in the vicinity of the silos to mitigate bank erosion, stabilization of the western bank south of the southern waste units, and rerouting of the streambed in two locations. Figures 2-1, 2-2, and 2-3 provide aerial photographs of Paddys Run for 1954, 1973, and 2000. Figure 2-2 (1973 photograph) also shows the locations of the two stream rerouting events. The reasons for the rerouting are not known. However, the northern reroute was likely intended to control bank erosion along the northwestern edge of the silos area.

Historical soil sampling and analysis data from the Paddys Run oxbow areas is summarized in the Project Specific Plan for Real-Time Scan of Paddys Run Corridor and Associated Drainage Features, Revision 2, Final, October 2003. Historical soil data from the PPDD, primarily collected during the predesign investigation of Area 2, Phase II, indicated two of the 25 surface samples had elevated total uranium concentrations of 86.9 mg/kg and 119 mg/kg. The Area 2, Phase II predesign work also included a total of 64 samples collected at depth along the ditch for total uranium, isotopic radium, and isotopic thorium. The maximum total uranium concentration at depth was 174 mg/kg (1.5-2 feet depth); there were no elevated isotopic radium and thorium results.

The OU5 Remedial Investigation/Feasibility Study (RI/FS) includes a 1986 Dames and More radiological survey of Paddys Run. The survey was conducted from the confluence of Paddys Run and the Great Miami River to the on-site railroad trestle bridge located north of the waste storage area and included a comprehensive radiological walkover survey of the stream bottom and banks. A survey was included in the RI/FS which indicated two areas with elevated gamma readings, one at the confluence of Paddys Run and the SSOD and one sough of the FCP (south of New Haven Road). Quantitative field frisker measurement values are not stated in the RI/FS.

Sediment monitoring takes place on a yearly basis at selected locations along Paddys Run, including at a background location (north of S.R. 126), north of the SSOD, from the SSOD itself, and from south of the SSLD under the current Integrated Environmental Monitoring Plan (IEMP). Table 2-1 summarizes the range of results from 1990 through 2002 for these four locations. Figure 2-4 shows the general locations for the recent rounds of sampling. For the 1990 to 2002 period, exceedances were primarily limited to the 1990 and 1992 samples for thorium-228, thorium-232 and radium-226 as compared to the sediment FRLs; one other exceedance in 1996 occurred for thorium-232. Table 2-2 summarizes all sediment FRL exceedances during the period 1990 through 2002, including the approximate sample location for each. The sediment FRLs are included in Table 1-4 or the SEP and are also included in the Table 2-2 footnote.

2.2 CONCEPTUAL SITE MODEL

Any potential contamination present in the Stream Corridor sediments could have come from a number of sources. These include discharge and/or seepage from the waste pits, contamination associated with silos activities, contamination associated with surficial discharge from the SSOD and PPDD, contamination from disposal activities in the South Field area, and/or more random dumping/disposal events along the stream's eastern bank, between the Waste Pits and the South Field area. Anecdotal evidence indicates that debris presumably associated with Fernald activities has been retrieved from Paddys Run stream banks in the past. In addition, relatively high levels of radium-226 contamination were discovered in exposed bluff soils immediately west of the Silos Area. Contamination that could have been released into Paddys Run include the primary radionuclides of concern at the site: uranium, radium-226, radium-228, thorium-228, and thorium-232.

Given the episodic high flow rates associated with Paddys Run and the scoured and dynamic nature of the streambed, if contamination persists in measurable quantities it most likely would be either associated with buried debris in stream banks, or present as debris/depositional layers in stable sedimentation areas. In the case of the former, the most likely area to encounter such debris would be along the eastern stream bank between the head of the Waste Pits Area and the toe of the South Field area, and in point bars associated with the abandoned streambed south of the Silos Area. In the case of the latter, these would most likely be areas immediately downstream of sharp stream bends, along the inside of the bend where systematic deposition takes place (point bars). If contamination is present it is also most likely buried beneath clean layers of more recent deposition. Of particular concern in both cases are point bars associated with the abandoned streambed downstream of the Silos Area since these represent sediment deposits that would have been developing at the time contamination releases were taking place, that would have seen potential over bank deposition since abandonment, and that would have been unaffected by scouring events for the last thirty years.

2.3 SCOPE

This PSP covers all data collection activities associated with predesign in the Stream Corridors, including physical sampling of sediments and/or soils and non-intrusive geophysical surveys.

All data collection activities will be consistent with the SCQ and Section 3.1 of the SEP. Physical samples will be collected in accordance with DQO SL-048 (Appendix A). The data will be utilized to assess whether constituent of concern (COC) concentrations in these areas are lower than the FRLs outlined in the OU5 ROD. The data collected under this plan will also be utilized to determine whether sediments and/or soils from Paddys Run meet the OSDF WAC, as defined in the SEP, the OSDF WAC Attainment Plan, and the OSDF Impacted Materials Placement Plan. All sampling activities and characterization data collection activities will conform to the requirements of the documents listed in Section 6.0.

2.4 DETERMINATION OF FRL COCs AND WAC COCs

2.4.1 WAC COCs

There is no historical evidence of sediments and/or soil exceeding WAC levels within the Stream Corridors' sediments. While it is unlikely that uranium or technetium-99 concentrations will be encountered that exceed WAC levels, sampling results will be compared to uranium and technetium-99 WAC requirements.

2.4.2 FRL COCs

Since Paddys Run and its associated tributaries carried run-off from virtually each and every remediation area, the entire list of COCs presented in Table 2-7 of the SEP will be retained and submitted for analysis with the exception of dioxins and furans. Table 2-3 presents a list of the constituents that will be retained for this investigation.

Dioxins and furans have been evaluated across the Fernald Closure Project (FCP) site in the various Remediation Areas (RAs). Only RA1 and RA6 had dioxins and/or furans listed as ASCOCs in Table 2-7 of the SEP. In RA1, dioxins and furans were dropped from the ASCOC list based on results that indicated they were not present in the area. In RA6, namely the waste pits area, dioxins and furans were encountered at extremely low levels. These levels were further evaluated based on recent guidance by Environmental Protection Agency (EPA). This latest guidance for evaluating the health-based risk of dioxins, in short, is to determine the concentration of each individual congener, multiply each concentration by the appropriate Toxicity Equivalence Factors (TEF), sum the corrected concentrations, and compare the total contribution of all dioxin and furan congeners to an established limit of 1 part per billion (ppb).

Based on the evaluation of the dioxins in RA6, it is likely that dioxins and furans are well within the acceptable risk level per EPA Guidelines. Therefore, it is unlikely that the two dioxins listed in the SEP as RA1 and RA6 ASCOCs, heptachlorodibenzo-p-dioxins and octochlorodibenzo-p-dioxin, will be encountered in the Stream Corridors, thus further evaluation for predesign of the Stream Corridors is not necessary, but will be further evaluated during the certification of the Stream Corridors.

2.5 DATA COLLECTION STRATEGY

The primary purpose of data collection is to identify the presence or absence of contaminants above their FRL requirements in soils and sediments associated with the stream corridors. Data collection will include three primary activities: intrusive sampling, non-intrusive geophysical surveys to identify buried material that may be associated with contamination, and real-time scans of suspect exposed sediments/bank soils that is being performed under the Project Specific Plan for Real-Time Scan of Paddys Run Corridor and Associated Drainage Features, Revision 2, Final, October 2003.

2.5.1 Non-Intrusive Geophysical Survey Strategy

Non-intrusive geophysical work will be employed to identify buried debris that may be associated with contamination. The focus of this work will be on areas where evidence of debris was encountered during recent field walk-downs. These areas include the eastern bank of Paddys Run due west of the Waste Pits area, the western bank of Paddys Run due west of the Advance Waste Water Treatment Facility, the east and west bank of the SSOD immediately adjacent to the Storm Sewer Retention Basin, and the western bank of the SSOD adjacent to the new Receiving/Incoming Materials Inspection Area and north of the former Active Flyash Pile. Because of the terrain, it is assumed the system deployed will need to be hand--carried. Figures 2-5 through 2-9 illustrate the locations where non-intrusive surveys will be conducted. Evidence of suspect debris (metallic anomalies, laboratory bottles, etc.) that are identified either visually or by the non-intrusive survey will be flagged and uncovered. Radiation screens will be performed for exposed soils along with visual inspection of the suspected debris. If there is evidence of the potential for elevated radionuclide concentrations (either based on visual evidence or elevated gross activity readings), the soil/sediment will be characterized. Characterization may consist of an *in situ* high-purity germanium detector (HPGe) measurement if the terrain permits, or with physical samples submitted for laboratory analysis.

2.5.2 FRL Sampling Strategy

2.5.2.1 Transect Sampling

Systematic soil/sediment sampling will take place on transect locations that were identified by a joint field walk-down, which included members of the Ohio Environmental Protection Agency. Figures 2-5 through 2-9 illustrate the locations selected for physical sampling. The transect locations contain a 'T' in the area designators (e.g. PRT-... where PR = Paddys Run and T = Transect) as described in Section 2.6. The focus of this systematic sampling will be on those portions of the stream identified as most likely to contain sediments that may have been impacted by past activities at the Fernald site.

For each transect, a minimum of three soil cores will be collected. These three cores will be collected on a line perpendicular to the stream flow that transects the sediment deposits of concern. One core will be in the centerline of the stream bed and the other two cores will be collected from the side slopes of the stream channel, 2 to 4 feet from the base of the streambed. If the streambed is greater than 40-feet wide at the location of the transect, then samples will be collected at increments of 20-feet in the streambed starting at the center point and moving out along the transect in either direction. The sample at the center point of the streambed will be analyzed for the full list of ASCOCs identified in Table 2-3. The additional samples that are collected from either side of the streambed and along the vertical bank will be analyzed for the primary radiological COCs only. However, if the center-point exhibits greater than FRL levels for a COC other than a primary rad, then the two samples on either side of the center point along with additional bounding samples will be collected and analyzed for the respective above-FRL constituent to bound the contamination. Likewise, if the sidewall samples are above FRL, these locations will be bound in all directions as well with additional samples. The documentation for these additional samples will be accomplished through the Variance/Field Change Notice (V/FCN) as described in Section 4.4. If there is too much water to perform the sampling, the location will be moved north or south away from the nearest transect. Any move of greater than 3-feet from the original location will be documented in a V/FCN and will be noted in the field paperwork.

At predefined transects (PRT-2, PRT-11, PRT-27, SSODT-6, SSODT-15, SSODT-20, and PPDDT-5) that present the greatest risk of contamination, a minimum of six samples (two in the stream bed and two in either sidewall) will be collected along the transects and analyzed in the same manner as noted above. These locations are shown on Figures 2-5 through 2-9 and identified in Appendix B. The cross-sections of each transect are also shown in Appendix D.

The preferred method for soil core retrieval is a direct-push tube with slam hammer or Macro-Core® hand sampler. In most cases, the depth interval will be 0-0.5'. For the cases where deeper cores are required, the entire length of the core will be scanned using a beta/gamma frisker. Scanning will be conducted down the length of the core and results will be recorded, along with soil type and visually identifiable features. The sampling personnel will perform this activity. If anomalous materials or possible fill areas are discovered then sampling activities will be suspended and a geologist will be notified. The geologist will determine the visual classification of the soil material, along with the frisker readings, and record this information on the Visual Classification of Soils Log. The geologist will also determine when sample borings have reached native soil.

Soil retrieved from the cores will represent 6-inch intervals.

2.5.2.2 Entry Channel Sampling

A number of small channels enter into both Paddys Run and the SSOD. At the intersection of these channels with the larger stream, two samples will be collected for the full list of ASCOCs. The first sample will be collected at the intersection and the second will be collected approximately 10-feet up the channel. Figures 2-5 through 2-9 illustrate the locations of these samples. These locations contain a 'C' in the area designator (e.g. PRC-... where PR = Paddys Run and C = Channel) as described in Section 2.6.

2.5.2.3 Debris Location Sampling

Aside from soil and/or sediment samples collected on predefined transect locations or channel inlet locations, samples will be collected at areas of identified debris deposits. These samples will be analyzed for the full list of ASCOCs as well. Figures 2-5 through 2-9 illustrate the locations of these samples. These locations contain a 'D' in the area designator (e.g. PRD-... where PR = Paddys Run and D = Debris) as described in Section 2.6.

2.5.2.4 Biased Sampling

Additional locations may be identified by either real-time scanning equipment or by non-intrusive geophysical surveys. Upon identification of these biased locations, samples will be collected and analyzed for the appropriate COCs relative to the identification technique. These locations contain a 'B' in the area designator (e.g. PRB-... where PR = Paddys Run and B = Biased) as described in Section 2.6. All additional biased samples will be documented through the V/FCN process as described in Section 4.4.

2.5.2.5 Annual Sampling for the Integrated Environmental Monitoring Plan (IEMP)

The annual sediment sampling is being integrated with this PSP as stated in the IEMP, Rev. 3. This will fulfill the annual sediment sampling requirements of the IEMP. There are twelve onsite locations and four offsite locations. These locations are shown on Figure 2-4 and identified in Appendix B.

2.6 SAMPLE IDENTIFICATION

All physical samples will be assigned unique alphanumeric identifications for data tracking purposes that will contain one or more of the following designators:

1. Area Designator:	Denotes physical sampling area or real-time measurement area: PR = Paddys Run PPDD = Pilot Plant Drainage Ditch SSOD = Storm Sewer Outfall Ditch OPR = Old Paddys Run RT = Real-Time (for biased physical sampling only)
2. Sample Type or Strategy	C = Channel D = Debris T = Transect B = Bias
2. Location Designator:	Designates the location by sequential numbering of (1, 2, 3, etc.). An alpha character (A, B, C, etc.) will also be included before the number to identify additional samples along each transect going from west to east or north to south. An alpha character may also be used following the number to indicate that the location had to be moved slightly due to an obstruction after the sampling has began at the original location.
3. Depth Interval (if applicable):	Denotes depth interval in 6-inch increments, 1 (0 to 0.5 feet), 2 (0.5 to 1 feet), etc.
4. Measurement Designator:	R = Radiological M = Metals S = Semi-volatiles L = Volatiles P = Pesticides and PCBs H = PAHs D = Dioxins/furans U = Total Uranium V = Archived sample

5. Quality Control Designators
   (if necessary): D = duplicate measurement
   TB = trip blank

Using these guidelines, examples for the unique identification scheme for the physical sampling are below:

PRT-2^1-R

PRT = Paddys Run Transect

2 = Second Location

1 = 0 to 0.5 foot interval

R = radiological constituents

PRT-A2^1-R

The same as above except that the A2 indicates that this sample location is along the same transect as PRT-2.

RTB-1^1-R

RTB = Biased location identified by Real-Time Scanning

1 = First biased location identified

1 = 0 to 0.5 foot interval

R = radiological constituent

TABLE 2-1

RANGE OF ENVIRONMENTAL SEDIMENT SAMPLING RESULTS (1990-2002)

Location	Radium-226 (pCi/g)	Thorium-232 (pCi/g)	Total Uranium (ppm)
Paddys Run Background	0.0 - 1.4	0.15 - 1.1	0.6 - 4.1
Paddys Run North of Storm Sewer Outfall Ditch	0.0 - 3.7	0.19 - 5.4	0.8 - 13
Storm Sewer Outfall Ditch	0.0 - 1.4	0.01 - 2.1	0.6 - 26
Paddys Run South of Storm Sewer Outfall Ditch	0.44 – 1.2	0.13 – 1.1	0.8 - 44
Sediment/Soil FRL	**2.9/1.7**	**1.6/1.5**	**210/82**

TABLE 2-2

SEDIMENT FRL EXCEEDANCES IN SSOD AND PADDYS RUN (1990-2002)[a,b,c]

General Location	Sample Identifier	Distance/ Reference Point[d]	Radionuclide	Result (pCi/g)	Sample Date
Paddys Run North of SSOD	PR800W	2625 ft. above SSOD	Radium-226	3.0	1990
Paddys Run North of SSOD	PR1600E	5250 ft. above SSOD	Radium-226	3.7	1990
Paddys Run North of SSOD	PR166	545 ft. above SSOD	Radium-226	2.3	1992
Paddys Run North of SSOD	PR1600E	5250 ft. above SSOD	Thorium-228	5.1	1990
Storm Sewer Outfall Ditch	SS0600S	1969 ft. above Paddys Run	Thorium-232	2.1	1990
Paddys Run North of SSOD	PR200E	656 ft. above SSOD	Thorium-232	5.4	1990
Paddys Run North of SSOD	PR900W	2953 ft. above SSOD	Thorium-232	3.0	1990
Paddys Run North of SSOD	PR1000E	3281 ft. above SSOD	Thorium-232	3.1	1990
Paddys Run North of SSOD	PR1000M	3281 ft. above SSOD	Thorium-232	3.9	1990
Paddys Run North of SSOD	PR1000W	3281 ft. above SSOD	Thorium-232	4.1	1990
Paddys Run North of SSOD	PR1100E	3609 ft. above SSOD	Thorium-232	3.6	1990
Paddys Run North of SSOD	PR1100M	3609 ft. above SSOD	Thorium-232	4.1	1990
Paddys Run North of SSOD	PR1100W	3609 ft. above SSOD	Thorium-232	3.1	1990
Paddys Run North of SSOD	PR1200E	3937 ft. above SSOD	Thorium-232	2.2	1990
Paddys Run North of SSOD	PR1200W	3937 ft. above SSOD	Thorium-232	2.4	1990
Paddys Run North of SSOD	PR1300E	4265 ft. above SSOD	Thorium-232	2.1	1990
Paddys Run North of SSOD	PR1300M	4265 ft. above SSOD	Thorium-232	4.2	1990
Paddys Run North of SSOD	PR1300W	4265 ft. above SSOD	Thorium-232	1.9	1990
Paddys Run North of SSOD	PR1400W	4593 ft. above SSOD	Thorium-232	2.7	1990
Paddys Run North of SSOD	PR1500M	4922 ft. above SSOD	Thorium-232	1.8	1990
Paddys Run North of SSOD	PR1500W	4922 ft. above SSOD	Thorium-232	1.8	1990
Paddys Run North of SSOD	PR1600W	5250 ft. above SSOD	Thorium-232	1.8	1990
Paddys Run North of SSOD	PR1700W	5578 ft. above SSOD	Thorium-232	1.8	1990
Paddys Run North of SSOD	PR1800E	5906 ft. above SSOD	Thorium-232	1.7	1990
Paddys Run North of SSOD	PR1900E	6234 ft. above SSOD	Thorium-232	2.1	1990
Paddys Run North of SSOD	PR2000E	6562 ft. above SSOD	Thorium-232	1.7	1990
Paddys Run North of SSOD	PR2000M	6562 ft. above SSOD	Thorium-232	2.0	1990
Storm Sewer Outfall Ditch	SSOD-538M	1765 ft. above Paddys Run	Thorium-232	1.8	1996

[a]Results are considered FRL exceedances in comparison to the following sediment FRLs (from Table 1-4 of the Sitewide Excavation Plan):
Radium-226 2.9 pCi/g
Thorium-228 3.2 pCi/g
Thorium-232 1.6 pCi/g

[b]Samples were collected once each year as part of the environmental monitoring program. Total number of samples collected are as follows:
1990 – 70 samples from Paddys Run north of SSOD; 21 samples from the SSOD
1992 – 12 samples from Paddys Run north of SSOD; 8 samples from the SSOD
1996 – 8 samples from Paddys Run north of SSOD; 5 samples from the SSOD.

[c]Analytical results have not been validated.

[d]Measurements are the distances from the confluence point of SSOD and Paddys Run.

TABLE 2-3

STREAM CORRIDORS LIST OF COCs

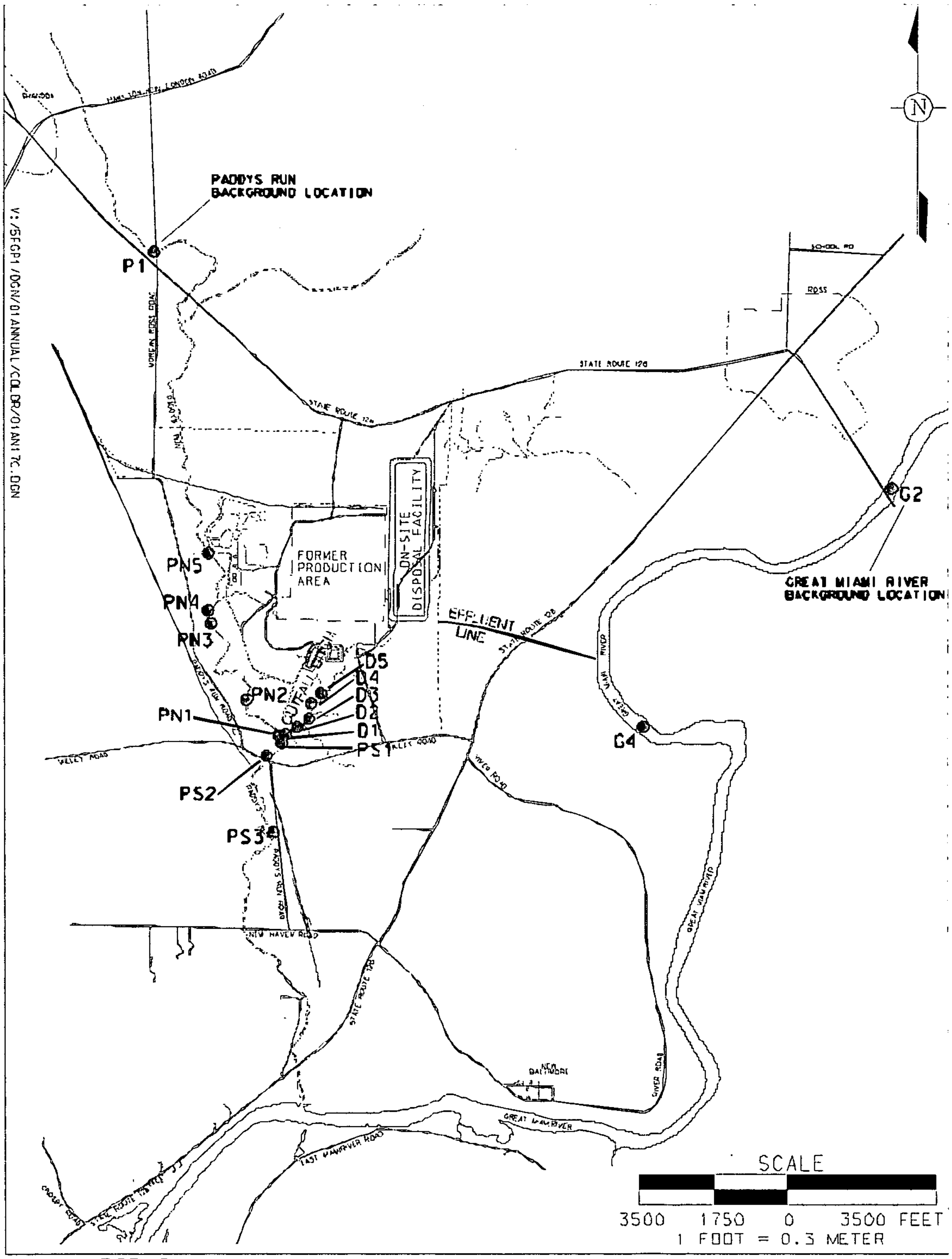
Primary COCs	FRL/*BTV*	Secondary COCs	FRL/*BTV*
Total Uranium	82 mg/kg	1,1-Dichloroethene	0.41 mg/kg
Radium-226	1.7 pCi/g	Antimony	*10 mg/kg*
Radium-228	1.8 pCi/g	Aroclor-1254	0.13 mg/kg
Thorium-228	1.7 pCi/g	Aroclor-1260	0.13 mg/kg
Thorium-232	1.5 pCi/g	Arsenic	12 mg/kg
		Benzo(a)anthracene	*1 mg/kg*
		Benzo(a)pyrene	*1 mg/kg*
		Benzo(b)fluoranthene	*1 mg/kg*
		Benzo(g,h,i)perlene	*1 mg/kg*
		Benzo(k)fluoranthene	*1 mg/kg*
		Beryllium	1.5 mg/kg
		Bromodichloromethane	4 mg/kg
		Cadmium	*5 mg/kg*
		Cesium-137	1.4 pCi/g
		Chrysene	*1 mg/kg*
		Dibenzo(a,h)anthracene	*0.088 mg/kg*
		Dieldrin	0.015 mg/kg
		Fluoranthene	*10 mg/kg*
		Fluoride	*1 mg/kg*
		Indeno(1,2,3-cd)pyrene	*1 mg/kg*
		Lead	*200 mg/kg*
		Lead-210	38 pCi/g
		Manganese	*1500 mg/kg*
		Molybdenum	*10 mg/kg*
		Neptunium-237	3.2 pCi/g
		Phenantrene	*5 mg/kg*
		Plutonium-238	78 pCi/g
		Pyrene	*10 mg/kg*
		Silver	*10 mg/kg*
		Strontium-90	14 pCi/g
		Technetium-99	29.1 pCi/g
		Tetrachloroethene	3.6 mg/kg
		Thorium-230	280 pCi/g
		Trichloroethene	25 mg/kg

FIGURE 2-1 1954 AERIAL PHOTOGRAPH OF PADDYS RUN

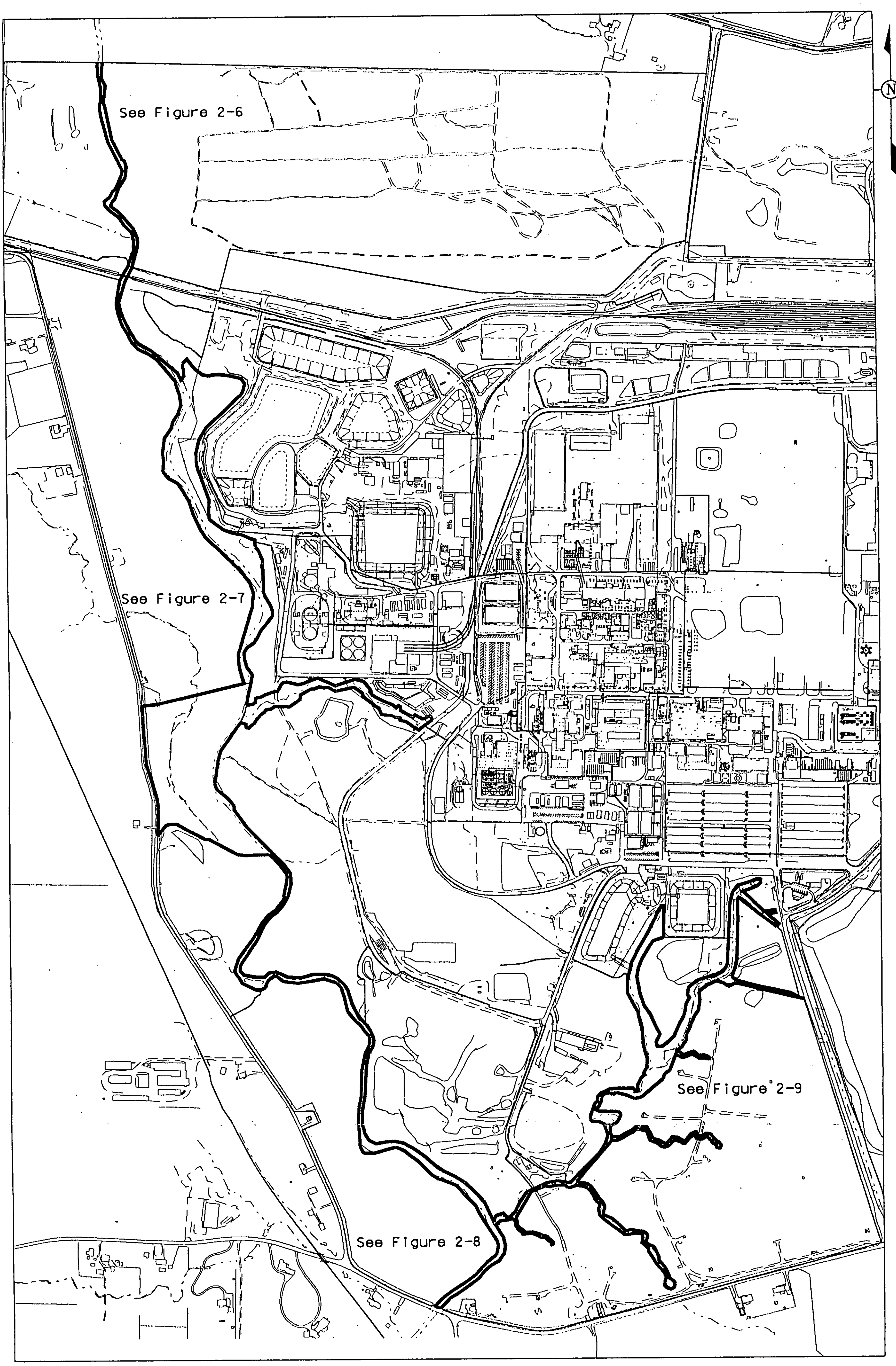
FIGURE 2-2 1973 AERIAL PHOTOGRAPH OF PADDYS RUN

FIGURE 2-3 2000 AERIAL PHOTOGRAPH OF PADDYS RUN

FIGURE 2-4 LOCATIONS OF SEDIMENT MONITORING SAMPLING



LEGEND:
FEMP BOUNDARY
SEDIMENT SAMPLE LOCATION



LEGEND:

PADDYS RUN/SSOD/PPDD BOUNDARY

SCALE

600 300 0 600 FEET

DRAFT

FIGURE 2-5. STREAM CORRIDORS

STATE PLANAR COORDINATE SYSTEM 1983

17-NOV-2003

000026

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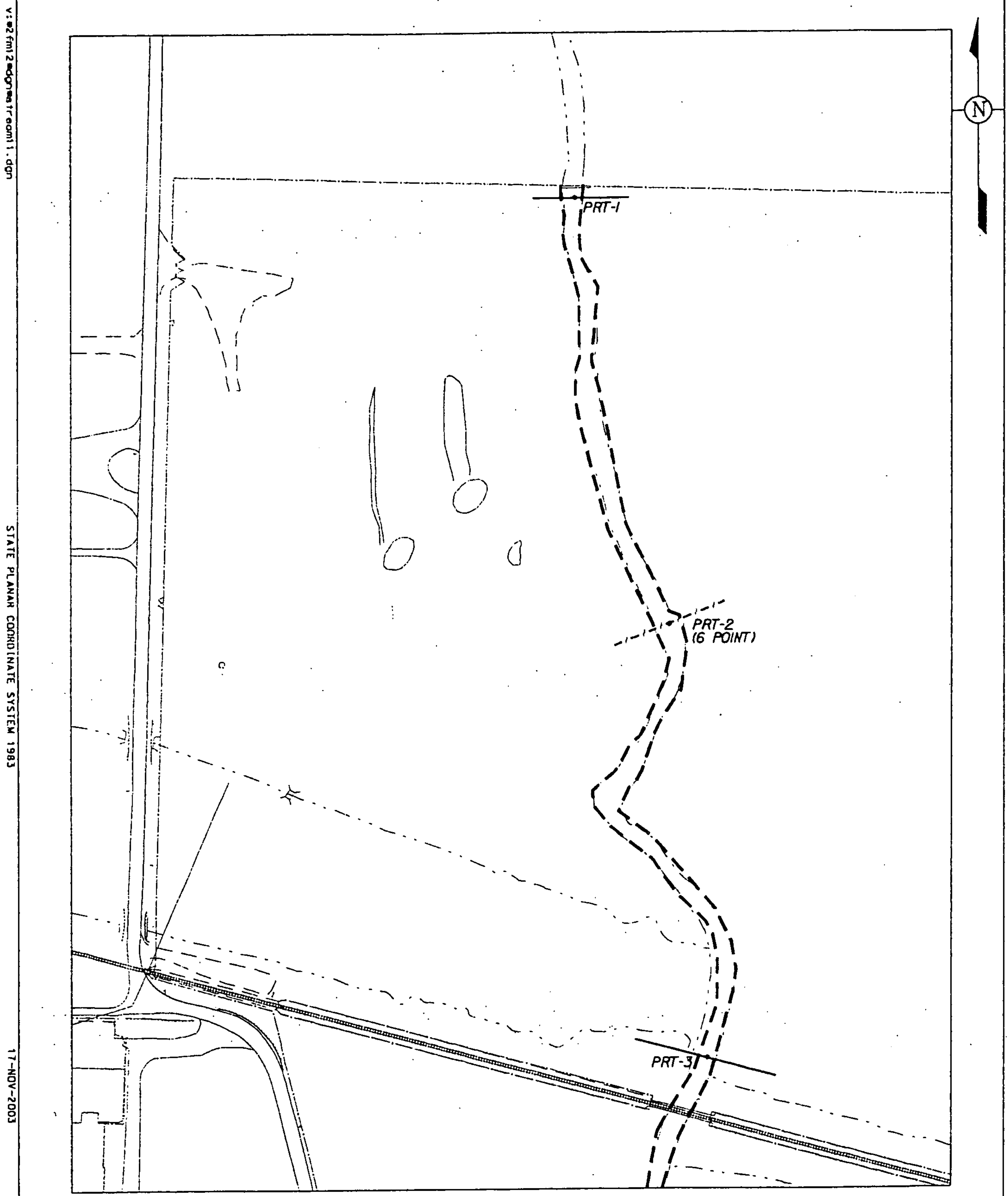


LEGEND:

- - - - STREAM CORRIDORS BOUNDARY

SCALE

200 100 0 200 FEET

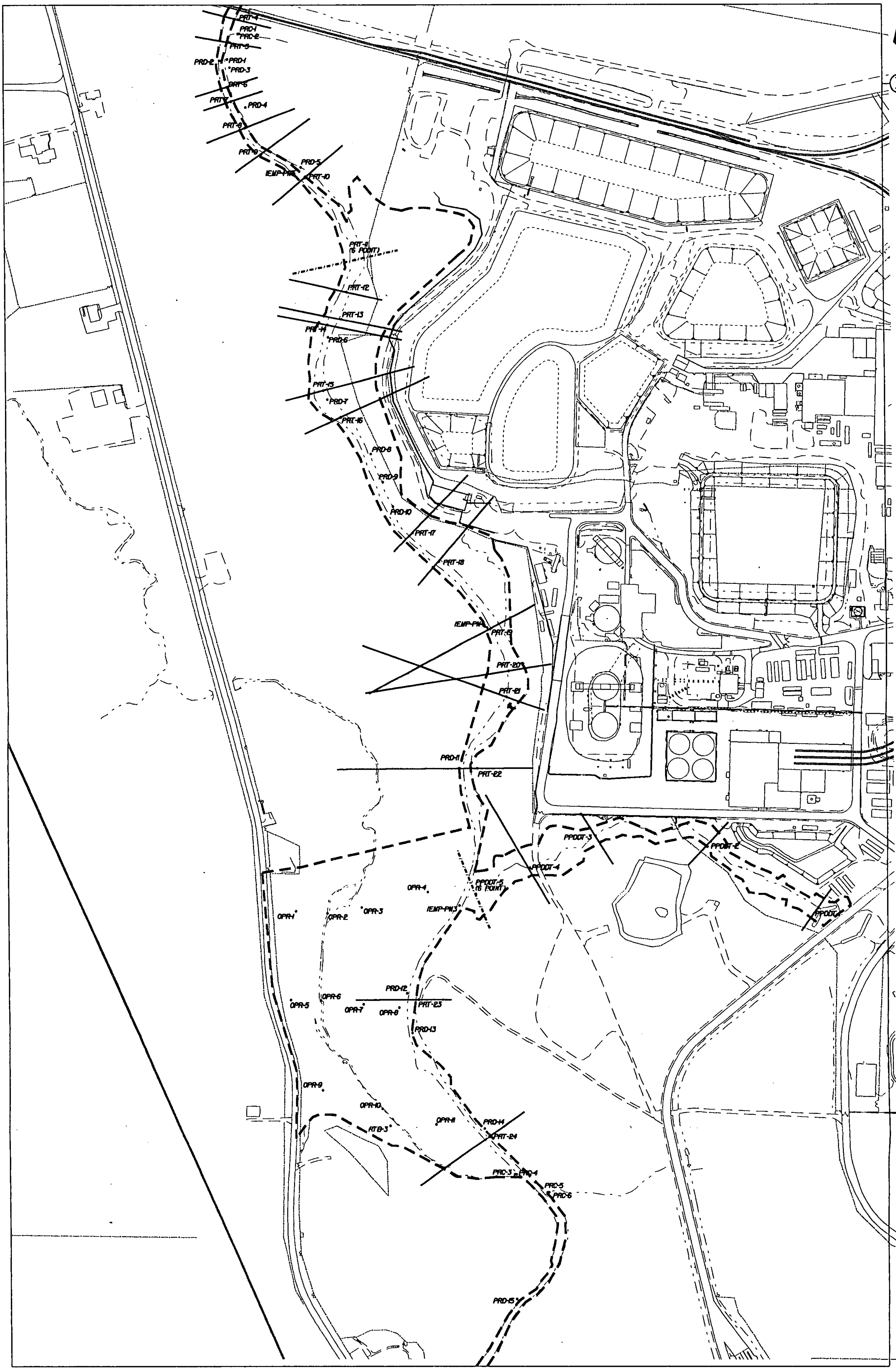
DRAFT

FIGURE 2-6. PADDY'S RUN (north)

v:\e2fm12\dgn\restream12.dgn

STATE PLANAR COORDINATE SYSTEM 1983

17-NOV-2003



LEGEND:

- - - - STREAM CORRIDORS BOUNDARY

SCALE

300 150 0 300 FEET

DRAFT

FIGURE 2-7. PADDYS RUN, SOUTHERN OXBOW (OLD PADDYS RUN) AND PILOT PLANT DRAINAGE DITCH

000028

5187

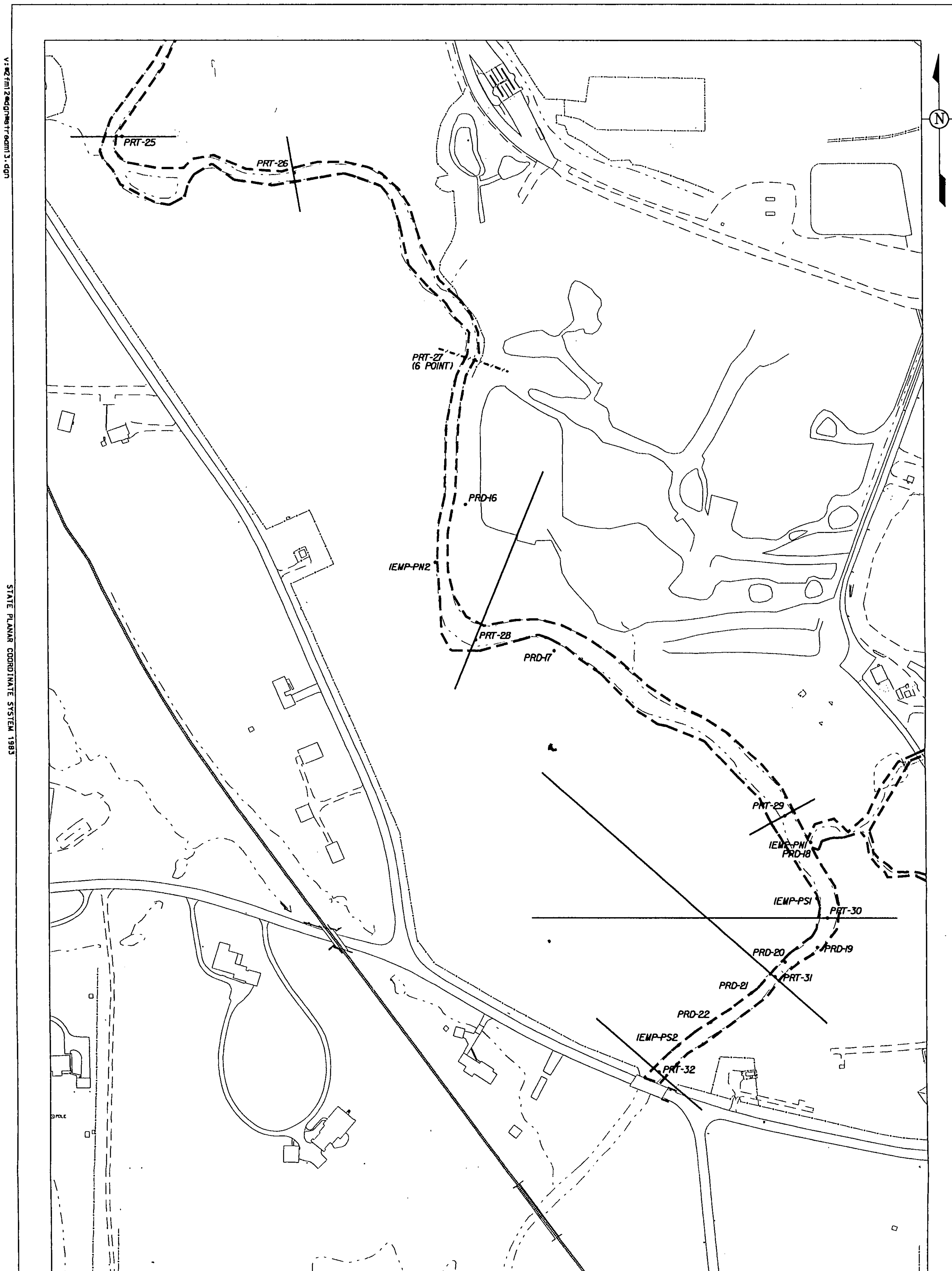


FIGURE 2-8. PADDYS RUN (south)

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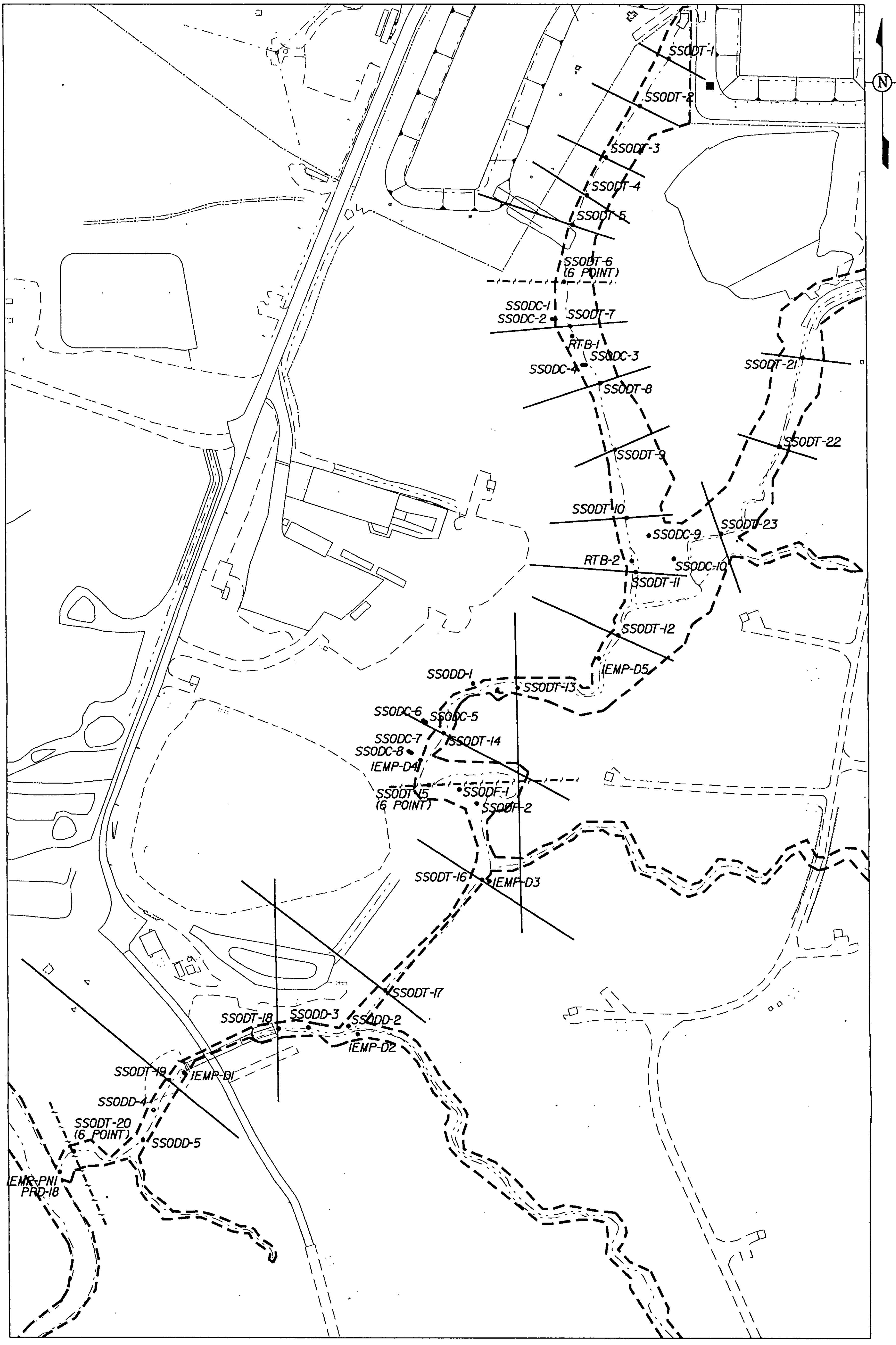
000029



v:\\fm12\\dgn\\stream14.dgn

STATE PLANAR COORDINATE SYSTEM 1983

17-NOV-2003

LEGEND:

STREAM CORRIDORS BOUNDARY

SCALE

160 80 0 160 FEET

DRAFT

FIGURE 2-9. STORM SEWER OUTFALL DITCH

000030

5187

3.0 SAMPLE COLLECTION AND METHODS

Direct-push liner sampling will be conducted in accordance with Procedure SMPL-01, Solids Sampling. At each sampling location, the surface vegetation within a 6-inch radius of the sample point will be removed using a stainless steel trowel or by hand with clean nitrile gloves while taking care to minimize the removal of any soil.

Soil samples will be collected from all planned locations, bias locations as identified by real-time scanning, non-intrusive geophysical surveys, and/or visual evidence for surface soils and down-hole logging/visual evidence for subsurface soil cores. If additional volume is necessary, samples will be collected from adjacent intervals and recorded on the appropriate field documentation. The sampling requirements are listed in Table 3-1.

All borings will be completed to the depth 6 inches. If refusal is encountered during the soil borings, additional borings within a 3-foot radius of the original point may be conducted. Borings will be manually collapsed. All survey stakes and/or sample location flags must remain in place until the characterization has been completed. At that time, the stakes/flags will be removed.

3.1 SURVEYING SAMPLE POINTS

The transects, channel locations, IEMP locations, debris samples, and biased samples will be marked by the Fluor Fernald Surveying and Mapping group. Northing (Y) and easting (X) coordinate values (NAD83, Ohio South Zone, #3402) will be determined using standard survey practices and standard positioning instrumentation (electronic total stations and GPS receivers). All field personnel using survey stakes or flags will mark field locations in a manner easily identifiable. (The survey stakes or flags will be removed after the characterization has been completed.) The sample points along the transects will be measured from the center point and documented in the field paperwork. This information will be submitted to the Surveying Lead and the Characterization Lead where the coordinates will be calculated and entered into the database. Survey information (coordinate data) will be downloaded at the completion of each survey job or at the end of each day and transferred electronically to the Survey Lead. This information will be forwarded to the Data Management Lead and/or designees and will be entered into the Sitewide Environmental Database.

3.2 MANUAL SAMPLING METHODS

Sampling will be performed per SMPL-01 in approximately 6-inch increments.

3.3 CORE FRISKER EVALUATION

In instances where borings are advanced to depths greater than 0.5 feet, the soil from each boring will be radiologically screened using a beta/gamma (Geiger-Mueller) survey meter. All results will be recorded on the Field Activity Log (FAL). A biased sample will be collected from the core interval that exhibited the highest activity reading and submitted for gamma spectroscopy analysis (TAL A). All biased samples and associated analysis will be documented in a V/FCN.

3.4 SOIL SAMPLE PROCESSING AND ANALYSIS

The Geoprobe® soil cores or hand-augered soil cuttings will be laid out on clean plastic and the appropriate sample intervals (as defined in Appendix B) will be separated to obtain the necessary samples following radiological field screening. Any debris (e.g., wood, concrete, metal) contained in a sample interval will be removed from the sample in the field and described on the FAL. The sampling and analytical requirements are summarized in Tables 3-1, the Soil Sampling Locations are listed in Appendix B, and the Target Analyte Lists area listed in Appendix C. At the discretion of the laboratory manager, the listed method may be changed if the required detection limit is still met.

3.5 EQUIPMENT DECONTAMINATION

Sampling equipment will be decontaminated before transporting to the sampling site. This includes the core sampler cutting shoe, hand auger buckets, and other sample collection tools between boring locations. All decontamination will be Level II decontamination as specified in Procedure SMPL-01. If used, the core barrel portion of the core sampler will be wiped down between sample intervals and locations to remove visible soil or material. Decontamination of the core barrel will not be necessary when using a liner insert because the core barrel will not come into contact with the sample.

3.6 SAMPLE HANDLING AND SHIPPING

Samples will be processed in accordance with Procedure SMPL-01 to ensure they are documented properly and the chain of custody and the sample integrity are maintained. All samples will be transported from the field to the on-site Sample Processing Laboratory to be distributed/shipped for analyses.

3.7 DISPOSITION OF WASTES

During completion of physical sampling activities, field personnel may generate small amounts of soil, sediment, water, contact waste, or construction rubble that was segregated from soil samples (e.g. bolts, nails, concrete, metal). Excess soil can be placed next to the boring location. Management of these waste streams will be coordinated with WAO. WAO will evaluate the sample material (including soil archive samples) and determine the disposition based on analytical data, material type, and location. If sample material is below-WAC, the material may be placed near the sample location. Any Category 2 material may be placed in an existing Category 2 pile for OSDF placement. Above-WAC sample material will be placed in Stockpile 7 (SP-7) or another designated above-WAC location.

Generation of decontamination waters will be minimized in the field. This water will be disposed of in a storm water collection basin that discharges to the Advanced Wastewater Treatment Facility after approval of the Wastewater Discharge Request Form, FS-F-4045. Contact waste generation will be minimized by limiting contact with sample media and by only using disposable materials that are necessary.

TABLE 3-1
SAMLING AND ANALYTICAL REQUIREMENTS

TAL	Method	Sample Matrix	ASL	Preserve	Holding Time	Container	Minimum Sample Mass/Volume
TAL A (selected rads)	Alpha or Gamma Spectroscopy	Solid	B	None	12 months	Plastic or stainless steel core liner or glass or polyethylene sample container	500 grams
TAL A/B/C (selected rads)	Alpha or Gamma Spectroscopy or GPC	Solid	B	Cool, 4°C	12 months	Glass with Teflon lined lid (due to TALs D/E/F/G)	700 grams (1200 grams)*
TAL D (Metals)	ICP/AES or ICP/MS				6 months		
TAL E (Fluoride)	Ion Chromatography				28 days		
TAL F/G (Pest&PCBs/ SVOCs)	GC or GC/MS				14 days		
TAL H (selected VOCs)	GC/MS	Solid	B	Cool, 4°C	14 days	Glass with Teflon lined lid	30 grams (90 grams)*
TAL H (selected VOCs)	GC/MS	Liquid (trip blank)	B	H_2SO_4 pH < 2 Cool 4°C	14 days	3 x 40 ml Glass vial with Teflon lined septa	120 ml fill to zero headspace
TAL I	Alpha or Gamma Spectroscopy	Solid	B	None	12 months	Plastic or stainless steel core liner or glass or polyethylene sample container	500 grams

* volume for QC samples
ASL – analytical support level
GC/MS – gas chromatograph/mass spectrography
GPC – gas proportional counting
ICP/AES – inductively coupled plasma/atomic electron spectrometry
ICP/MS – inductively coupled plasma/mass spectrometry

4.0 QUALITY ASSURANCE REQUIREMENTS

4.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS AND DATA VALIDATION

In accordance with the requirements of DQO SL-048, Revision 5 (Appendix A), the field quality control, analytical, and data validation requirements are as follows:

- All laboratory analyses will be performed at ASL B
- All analytical data will require a certificate of analysis and 10 percent of the analytical data will also require the associated quality assurance/quality control results. A minimum of 10 percent of the analytical data from each laboratory will be validated to ASL B. All field data forms will be validated
- One trip blank will be taken each day that volatile organic compound (VOC) samples are collected or one per 20 VOC samples that are collected, whichever is more frequent. In addition, a lab matrix spike duplicate will be designated on the Chain of Custody form for each organic release sent for off-site analysis.

If any sample collection or analysis methods are used that are not in accordance with the SCQ, the Project Manager and Characterization Manager must determine if the qualitative data from the samples will be beneficial to WAC attainment decision making. If the data will be beneficial, the Project Manager and Characterization Manager will ensure that:

- The PSP is revised through a V/FCN to include references confirming that the new method is sufficient to support data needs,
- Variations from the SCQ methodology are documented in the PSP, or
- Data validation of the affected samples is requested or qualifier codes of J (estimated) and R (rejected) be attached to detected and non-detected results, respectively.

4.2 APPLICABLE PROCEDURES, MANUALS AND DOCUMENTS

To assure consistency and data integrity, field activities in support of this PSP will follow the requirements and responsibilities outlined in controlled procedures and manufacturer operational manuals. Applicable procedures and manuals include the following:

- ALS 9501, Shipping Samples to Offsite Laboratories
- ALS 9503, Processing Samples through the Sample Processing Laboratory
- ALS 9505, Using the FACTS Database to Process Samples
- ALS 7532, Analytical Laboratory Services Internal Chain of Custody
- ADM-02, Field Project Prerequisites

- Fernald Closure Project Approved Laboratories List
- EP-0003, Unexpected Discovery of Cultural Resources
- EQT-05, Geodimeter® 4000 Surveying System
- EQT-06, Geoprobe® Model 5400 Operation and Maintenance Manual
- EW-0002, Chain of Custody/Request for Analysis Record for Sample Control
- EW-1021, Preparation of the PWID Report
- FD-1000, Sitewide CERCLA Quality (SCQ) Assurance Project Plan
- RM-0020, Radiological Control Requirements Manual
- RM-0021, Safety Performance Requirements Manual
- SMPL-01, Solids Sampling
- SMPL-21, Collection of Field Quality Control Samples
- Sitewide Excavation Plan (SEP)
- OSDF Impacted Materials Placement Plan
- OSDF WAC Attainment Plan
- Sitewide CERCLA Quality (SCQ) Assurance Project Plan
- PSP for Real-Time Scan of Paddys Run Corridor and Associated Drainage Features

4.3 PROJECT REQUIREMENTS FOR INDEPENDENT ASSESSMENTS

Project management has ultimate responsibility for the quality of the work processes and the results of the sampling activities covered by this PSP. The Quality Assurance (QA) organization may conduct independent assessments of the work process and operations to assure the quality of performance. Assessment will encompass technical and procedural requirements of this PSP and the SCQ. Independent assessments will be performed by conducting a surveillance. Surveillances will be planned and documented according to Section 12.3 of the SCQ.

4.4 IMPLEMENTATION OF FIELD CHANGES

Before implementation changes, the Field Sampling Lead will be informed of the proposed changes. Once the Field Sampling Lead has obtained written or verbal approval (electronic mail is acceptable), the changes may be implemented. Changes to the PSP will be noted in the applicable FALs and on a V/FCN. The completed V/FCN must include the signatures of the Characterization Manager, Sampling Lead, Project Manager, WAO Representative, and QA Representative and should be completed within seven working days of implementation of the change

5.0 SAFETY AND HEALTH

All FCP employees, visitors, vendors, and contractors associated with these activities must abide by site work permit requirements, Environmental Services procedures and/or construction travelers prepared by Fluor Fernald. Technicians will conform to hazard controls established by personnel representing the Radiological Control, Safety, and Industrial Hygiene. All work on this project will be performed in accordance with applicable Environmental Services procedures, RM-0021 (Safety Performance Requirements Manual), FCP work permits, penetration permits, and other applicable safety permits. Concurrence with applicable safety permits (indicated by the signature of each field team member assigned to this project) is required by each team member in the performance of their assigned duties. In addition to permits, procedures, and the requirements of this document, Fluor Fernald and any subcontractors will comply with all federal, state, and local requirements (e.g., OSHA, ODH, etc.).

The Field Sampling Lead will ensure that each technician performing sampling related to this project has been trained to the relevant sampling procedures, including safety precautions. Technicians who do not sign project safety and technical briefing forms will not participate in the execution of sampling activities related to the completion of assigned project responsibilities. A copy of applicable safety permits/surveys issued for worker safety and health will be posted at the sampling area during sampling activities. A safety briefing will be conducted before initiating field activities.

The Characterization Lead or designee, Soil Sampling Manger or designee, and team members will assess the safety of performing sampling activities on the surfaces of the areas to be sampled prior to the start of fieldwork. This will include vehicle positioning limitations, fall hazards, and vehicle stability of the Geoprobe®. Hazards must be corrected/controlled prior to the start of work.

Fluor Fernald managers and supervisors are responsible for ensuring that all field activities comply with site safety and health requirements and applicable work plan document(s). All personnel have stop-work authority for imminent safety and health hazards. Safety and health requirements/procedures for this plan will be governed by RM-0021, site work permits, procedures, and the overall strategy discussed within this document.

All emergencies shall be reported immediately to the Site Communications Center by contacting "CONTROL" on Channel 2 or by cellular phone at 648-6511.

6.0 DATA MANAGEMENT

The data management process will be implemented to ensure that information collected during the investigation will be properly managed to satisfy data end use requirements after completion of the field activities.

As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on a Field Activity Log, which should be sufficient for accurate reconstruction of the events without reliance on memory. Sample Collection Logs will be completed according to protocol specified in Appendix B of the SCQ and in applicable procedures. These forms will be maintained in loose-leaf form and uniquely numbered following the sampling event. A copy of the field logs will be sent to the Characterization Manager upon request.

All field measurements, observations, and sample collection information associated with physical sample collection will be recorded, as applicable, on the Sample Collection Log, the FAL, and the Chain of Custody/Request for Analysis Form, as required. The method of sample collection will be specified in the Field Activity Log. The PSP number will be on all documentation associated with these sampling activities.

Samples will be assigned a unique sample number as explained in Section 4.6. This unique sample identifier will appear on the Sample Collection Log and Chain of Custody/Request for Analysis and will be used to identify the samples during analysis, data entry, and data management.

All physical samples will be collected and reported at ASL B unless otherwise specified in a V/FCN. Field data packages will consist of the chain of custody form, field activity logs, and sample collection logs. Technicians will review all field data for completeness and accuracy and then forward the field data package to the Field Data Validation Contact for final review. All field data packages associated with physical sampling will be independently validated. Standard required information will be entered into the SED. The original field data packages will be filed and controlled by the Sample and Data Management department.

Laboratory analytical data packages will be filed and distributed in accordance with existing data management procedures. All analytical data and data validation qualifiers will be transferred (from FACTS) or entered into the SED per existing procedures. The Data Management Contact or designee will evaluate the data and if needed a data group form will be completed for each material tracking location (as identified by WAO) and transmitted to WAO for WAC documentation.

APPENDIX A

DATA QUALITY OBJECTIVE
SL-048, REVISION 5

Control Number ___________

Fernald Environmental Management Project

Data Quality Objectives

Title: Delineating the Extent of Constituents of Concern During Remediation Sampling

Number: SL-048

Revision: 5

Effective Date: February 26, 1999

Contact Name: Eric Kroger

Approval: (signature on file) Date: 2/25/99
James E. Chambers
DQO Coordinator

Approval: (signature on file) Date: 2/26/99
J.D. Chiou
SCEP Project Director

Rev. #	0	1	2	3	4	5	6
Effective Date:	9/19/97	10/3/97	4/15/98	6/17/98	7/14/98	2/26/99	

DATA QUALITY OBJECTIVES
Delineating the Extent of Constituents of Concern During Remediation Sampling

Members of Data Quality Objectives (DQO) Scoping Team
The members of the DQO team include a project lead, a project engineer, a field lead, a statistician, a lead chemist, a sampling supervisor, and a data management lead.

Conceptual Model of the Site
Media is considered contaminated if the concentration of a constituent of concern (COC) exceeds the final remediation levels (FRLs). The extent of specific media contamination was estimated and published in the Operable Unit 5 Feasibility Study (FS). These estimates were based on kriging analysis of available data for media collected during the Remedial Investigation (RI) effort and other FEMP environmental characterization studies. Maps outlining contaminated media boundaries were generated for the Operable Unit 5 FS by overlaying the results of the kriging analysis data with isoconcentration maps of the other constituents of concern (COCs), as presented in the Operable Unit 5 RI report, and further modified by spatial analysis of maps reflecting the most current media characterization data. A sequential remediation plan has been presented that subdivides the FEMP into seven construction areas. During the course of remediation, areas of specific media may require additional characterization so remediation can be carried out as thoroughly and efficiently as possible. As a result, additional sampling may be necessary to accurately delineate a volume of specific media as exceeding a target level, such as the FRL or the Waste Attainment Criterion (WAC). Each individual Project-Specific Plan (PSP) will identify and describe the particular media to be sampled. This DQO covers all physical sampling activities associated with Pre-design Investigations, precertification sampling, WAC attainment sampling or regulatory monitoring that is required during site remediation.

1.0 Statement of Problem

If the extent (depth and/or area) of the media COC contamination is unknown, then it must be defined with respect to the appropriate target level (FRL, WAC, or other specified media concentration).

2.0 Identify the Decision

Delineate the horizontal and/or vertical extent of media COC contamination in an area with respect to the appropriate target level.

3.0 Inputs That Affect the Decision

Informational Inputs - Historical data, process history knowledge, the modeled extent of COC contamination, and the origins of contamination will be required to establish a sampling plan to delineate the extent of COC contamination. The desired precision of the delineation must be weighed against the cost of collecting and analyzing additional samples in order to determine the optimal sampling density. The project-specific plan will identify the optimal sampling density.

Action Levels - COCs must be delineated with respect to a specific action level, such as FRLs and On-Site Disposal Facility (OSDF) WAC concentrations. Specific media FRLs are established in the OU2 and OU5 RODs, and the WAC concentrations are published in the OU5 ROD. Media COCs may also require delineation with respect to other action levels that act as remediation drivers, such as Benchmark Toxicity Values (BTVs).

4.0 The Boundaries of the Situation

Temporal Boundaries - Sampling must be completed within a time frame sufficient to meet the remediation schedule. Time frames must allow for the scheduling of sampling and analytical activities, the collection of samples, analysis of samples and the processing of analytical data when received.

Scale of Decision Making - The decision made based upon the data collected in this investigation will be the extent of COC contamination at or above the appropriate action level. This delineation will result in media contaminant concentration information being incorporated into engineering design, and the attainment of established remediation goals.

Parameters of Interest - The parameters of interest are the COCs that have been determined to require additional delineation before remediation design can be finalized with the optimal degree of accuracy.

5.0 Decision Rule

If existing data provide an unacceptable level of uncertainty in the COC delineation model, then additional sampling will take place to decrease the model uncertainty. When deciding what additional data is needed, the costs of additional sampling and analysis must be weighed against the benefit of reduced uncertainty in the delineation model, which will eventually be used for assigning excavation, or for other purposes.

6.0 Limits on Decision Errors

In order to be useful, data must be collected with sufficient areal and depth coverage, and at sufficient density to ensure an accurate delineation of COC concentrations. Analytical sensitivity and reproducibility must be sufficient to differentiate the COC concentrations below their respective target levels.

Types of Decision Errors and Consequences

Decision Error 1 - This decision error occurs when the decision maker determines that the extent of media contaminated with COCs above action levels is not as extensive as it actually is. This error can result in a remediation design that fails to incorporate media contaminated with COC(s) above the action level(s). This could result in the re-mobilization of excavation equipment and delays in the remediation schedule. Also, this could result in media contaminated above action levels remaining after remediation is considered complete, posing a potential threat to human health and the environment.

Decision Error 2 - This decision error occurs when the decision maker determines that the extent of media contaminated above COC action levels is more extensive than it actually is. This error could result in more excavation than necessary, and this excess volume of materials being transferred to the OSDF, or an off-site disposal facility if contamination levels exceed the OSDF WAC.

True State of Nature for the Decision Errors - The true state of nature for Decision Error 1 is that the maximum extent of contamination above the FRL is more extensive than was determined. The true state of nature for Decision Error 2 is that the maximum extent of contamination above the FRL is not as extensive as was determined. Decision Error 1 is the more severe error.

7.0 Optimizing Design for Useable Data

7.1 Sample Collection

A sampling and analytical testing program will delineate the extent of COC contamination in a given area with respect to the action level of interest. Existing data, process knowledge, modeled concentration data, and the origins of contamination will be considered when determining the lateral and vertical extent of sample collection. The cost of collecting and analyzing additional samples will be weighed against the benefit of reduced uncertainty in the delineation model. This will determine the sampling density. Individual PSPs will identify the locations and depths to be sampled, the sampling density necessary to obtain the desired accuracy of the delineation, and if samples will be analyzed by the on-site or off-site laboratory. The PSP will also identify the sampling increments to be selectively analyzed for concentrations of the COC(s) of interest, along with field work requirements. Analytical requirements will be listed in the PSP. The chosen analytical methodologies are able to achieve a detection limit capable of resolving the COC action level. Sampling of groundwater monitoring wells may require different purge requirements than those stated in the SCQ (i.e., dry well definitions or small purge volumes). In order to accommodate sampling of wells that go dry prior to completing the purge of the necessary well volume, attempts to sample the monitoring wells will be made 24 hours after purging the well dry. If, after the 24 hour period, the well does not yield the required volume, the analytes will be collected in the order stated in the applicable PSP until the well goes dry. Any remaining analytes will not be collected. In some instances, after the 24 hour wait the well may not yield any water. For these cases, the well will be considered dry and will not be sampled.

7.2 COC Delineation

The media COC delineation will use all data collected under the PSP, and if deemed appropriate by the Project Lead, may also include existing data obtained from physical samples, and if applicable, information obtained through real-time screening. The delineation may be accomplished through modeling (e.g. kriging) of the COC concentration data with a confidence limit specific to project needs that will reduce the potential for Decision Error 1. A very conservative approach to delineation may also be utilized where the boundaries of the contaminated media are extended to the first known vertical and horizontal sample locations that reveal concentrations below the desired action level.

7.3 QC Considerations

Laboratory work will follow the requirements specified in the SCQ. If analysis is to be carried out by an off-site laboratory, it will be a Fluor Daniel Fernald approved full service laboratory. Laboratory quality control measures include a media prep blank, a laboratory control sample (LCS), matrix duplicates and matrix spike. Typical Field QC samples are not required for ASL B analysis. However the PSPs may specify appropriate field QC samples for the media type with respect to the ASL in accordance with the SCQ, such as field blanks, trip blanks, and container blanks. All field QC samples will be analyzed at the associated field sample ASL. Data will be validated per project requirements, which must meet the requirements specified in the SCQ. Project-specific validation requirements will be listed in the PSP.

Per the Sitewide Excavation Plan, the following ASL and data validation requirements apply to all soil and soil field QC samples collected in association with this DQO:

- If samples are analyzed for Pre-design Investigations and/or Precertification, 100% of the data will be analyzed per ASL B requirements. For each laboratory used for a project, 90% of the data will require only a Certificate of Analysis, the other 10% will require the Certificate of Analysis and all associated QA/QC results, and will be validated to ASL B. Per Appendix H of the SEP, the minimum detection level (MDL) for these analyses will be established at approximately 10% of the action level (the action level for precertification is the

FRL; the action level for pre-design investigations can be several different action levels, including the FRL, the WAC, RCRA levels, ALARA levels, etc.). If this MDL is different from the SCQ-specified MDL, the ASL will default to ASL E, though other analytical requirements will remain as specified for ASL B.

- If samples are analyzed for WAC Attainment and/or RCRA Characteristic Areas Delineation, 100% of the data will be analyzed and reported to ASL B with 10% validated. The ASL B package will include a Certificate of Analysis along with all associated QA/QC results. Total uranium analyses using a higher detection limit than is required for ASL B (10 mg/kg) may be appropriate for WAC attainment purposes since the WAC limit for total uranium is 1,030 mg/kg. In this case, an ASL E designation will apply to the analysis and reporting to be performed under the following conditions:

    - all of the ASL B laboratory QA/QC methods and reporting criteria will apply with the exception of the total uranium detection limit
    - the detection limit will be ≤10% of the WAC limit (e.g., ≤103 mg/kg for total uranium).

- If delineation data are also to be used for certification, the data must meet the data quality objectives specified in the Certification DQO (SL-043).

- Validation will include field validation of field packages for ASL B or ASL D data.

All data will undergo an evaluation by the Project Team, including a comparison for consistency with historical data. Deviations from QC considerations resulting from evaluating inputs to the decision from Section 3, must be justified in the PSP such that the objectives of the decision rule in Section 5 are met.

7.4 Independent Assessment

Independent assessment shall be performed by the FEMP QA organization by conducting surveillances. Surveillances will be planned and documented in accordance with Section 12.3 of the SCQ.

7.5 Data Management

Upon receipt from the laboratory, all results will be entered into the SED as qualified data using standard data entry protocol. The required ASL B, D or E data will undergo analytical validation by the FEMP validation team, as required (see Section 7.3). The Project Manager will be responsible to determine data usability as it pertains to supporting the DQO decision of determining delineation of media

COC's.

7.6 Applicable Procedures

Sample collection will be described in the PSP with a listing of applicable procedures. Typical related plans and procedures are the following:

- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ).
- SMPL-01, *Solids Sampling*
- SMPL-02, *Liquids and Sludge Sampling*
- SMPL-21, *Collection of Field Quality Control Samples*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance*
- EQT-23, *Operation of High Purity Germanium Detectors*
- EQT-30, *Operation of Radiation Tracking Vehicle Sodium Iodide Detection System*

Data Quality Objectives
Delineating the Extent of Constituents of Concern During Remediation Sampling

1A. Task/Description: Delineating the extent of contamination above the FRLs

1.B. Project Phase: (Put an X in the appropriate selection.)

RI [ ] FS [ ] RD [X] RA [ ] RvA [ ] OTHER [ ]

1.C. DQO No.: SL-048, Rev. 5 DQO Reference No.:____________

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2. Media Characterization: (Put an X in the appropriate selection.)

Air [ ] Biological [ ] Groundwater [X] Sediment [X] Soil [X]

Waste [X] Wastewater [ ] Surface water [ ] Other (specify) ______

---

3. Data Use with Analytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable Data Use.)

Site Characterization
A [ ] B [X] C [ ] D [X] E [X]

Risk Assessment
A [ ] B [ ] C [ ] D [ ] E [ ]

Evaluation of Alternatives
A [ ] B [ ] C [ ] D [ ] E [ ]

Engineering Design
A [ ] B [X] C [ ] D [X] E [X]

Monitoring during remediation
A [X] B [X] C [ ] D [X] E [X]

Other
A [ ] B [ ] C [ ] D [ ] E [ ]

4.A. Drivers: Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and the OU2 and/or OU5 Record of Decision (ROD).

4.B. Objective: Delineate the extent of media contaminated with a COC (or COCs) with respect to the action level(s) of interest.

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5. Site Information (Description):

6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

1. pH	[X] *	2. Uranium	[X] *	3. BTX	[ ]
Temperature	[X] *	Full Radiological	[X] *	TPH	[ ]
Specific Conductance	[X] *	Metals	[X] *	Oil/Grease	[ ]
Dissolved Oxygen	[X] *	Cyanide	[ ]		
Technetium-99	[X] *	Silica	[ ]		

4. Cations	[ ]	5. VOA	[X] *	6. Other (specify)
Anions	[ ]	BNA	[X] *	
TOC	[ ]	Pesticides	[X] *	
TCLP	[X] *	PCB	[X] *	
CEC	[ ]	COD	[ ]	

*If constituent is identified for delineation in the individual PSP.

6.B. Equipment Selection and SCQ Reference:

Equipment Selection	Refer to SCQ Section
ASL A ______	SCQ Section: ______
ASL B X	SCQ Section: App. G Tables G-1&G-3
ASL C ______	SCQ Section: ______
ASL D X	SCQ Section: App. G Tables G-1&G-3
ASL E X (See sect. 7.3, pg. 8)	SCQ Section: App. G Tables G-1&G-3

7.A. Sampling Methods: (Put an X in the appropriate selection.)

Biased [X] Composite [ ] Environmental [X] Grab [ ] Grid [X]

Intrusive [X] Non-Intrusive [ ] Phased [ ] Source [ ]

DQO Number: SL-048, Rev. 5

7.B. Sample Work Plan Reference: This DQO is being written prior to the PSPs.

Background samples: OU5 RI

7.C. Sample Collection Reference:

Sample Collection Reference: SMPL-01, SMPL-02, EQT-06

---

8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

Trip Blanks	[X]*	Container Blanks	[X]++
Field Blanks	[X]+	Duplicate Samples	[X]***
Equipment Rinsate Samples	[X]***	Split Samples	[X]**
Preservative Blanks	[ ]	Performance Evaluation Samples	[ ]
Other (specify)			

- * For volatile organics only
- ** Split samples will be collected where required by EPA or OEPA.
- *** If specified in PSP.
- \+ Collected at the discretion of the Project Manager (if warranted by field conditions)
- \+\+ One per Area and Phase Area per container type (i.e. stainless steel core liner/plastic core liner/Geoprobe tube).

8.B. Laboratory Quality Control Samples:

Method Blank	[X]	Matrix Duplicate/Replicate	[X]
Matrix Spike	[X]	Surrogate Spikes	[ ]
Tracer Spike	[ ]		

Other (specify) Per SCQ

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

APPENDIX B

SOIL SAMPLE LOCATIONS

APPENDIX B
SOIL SAMPLE LOCATIONS
PADDY'S RUN TRANSECTS

Transect	Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
PRT-1	PRT-1	0 - 0.5	PRT-1^1-RMPS	ABCDEFG	483985.95	1345744.65
			PRT-1^1-L	H		
	PRT-A1	0 - 0.5	PRT-A1^1-R	A	TBD	TBD
	PRT-B1	0 - 0.5	PRT-B1^1-R	A	TBD	TBD
PRT-2	PRT-2	0 - 0.5	PRT-2^1-RMPS	ABCDEFG	483361.67	1345880.82
			PRT-2^1-L	H		
	PRT-A2	0 - 0.5	PRT-A2^1-RMPS	ABCDEFG	TBD	TBD
			PRT-A2^1-L	H		
	PRT-B2	0 - 0.5	PRT-B2^1-R	A	TBD	TBD
	PRT-C2	0 - 0.5	PRT-C2^1-R	A	TBD	TBD
	PRT-D2	0 - 0.5	PRT-D2^1-R	A	TBD	TBD
	PRT-E2	0 - 0.5	PRT-E2^1-R	A	TBD	TBD
PRT-3	PRT-3	0 - 0.5	PRT-3^1-RMPS	ABCDEFG	482733.13	1345936.15
			PRT-3^1-L	H		
	PRT-A3	0 - 0.5	PRT-A3^1-R	A	TBD	TBD
	PRT-B3	0 - 0.5	PRT-B3^1-R	A	TBD	TBD
PRT-4	PRT-4	0 - 0.5	PRT-4^1-RMPS	ABCDEFG	482619.145	1345908.058
			PRT-4^1-L	H		
	PRT-A4	0 - 0.5	PRT-A4^1-R	A	TBD	TBD
	PRT-B4	0 - 0.5	PRT-B4^1-R	A	TBD	TBD
PRT-5	PRT-5	0 - 0.5	PRT-5^1-RMPS	ABCDEFG	482547.875	1345881.94
			PRT-5^1-L	H		
	PRT-A5	0 - 0.5	PRT-A5^1-R	A	TBD	TBD
	PRT-B5	0 - 0.5	PRT-B5^1-R	A	TBD	TBD
PRT-6	PRT-6	0 - 0.5	PRT-6^1-RMPS	ABCDEFG	482409.26	1345872.015
			PRT-6^1-L	H		
	PRT-A6	0 - 0.5	PRT-A6^1-R	A	TBD	TBD
	PRT-B6	0 - 0.5	PRT-B6^1-R	A	TBD	TBD
PRT-7	PRT-7	0 - 0.5	PRT-7^1-RMPS	ABCDEFG	482365.315	1345884.895
			PRT-7^1-L	H		
	PRT-A7	0 - 0.5	PRT-A7^1-R	A	TBD	TBD
	PRT-B7	0 - 0.5	PRT-B7^1-R	A	TBD	TBD
PRT-8	PRT-8	0 - 0.5	PRT-8^1-RMPS	ABCDEFG	482283.142	1345925.986
			PRT-8^1-L	H		
	PRT-A8	0 - 0.5	PRT-A8^1-R	A	TBD	TBD
	PRT-B8	0 - 0.5	PRT-B8^1-R	A	TBD	TBD
PRT-9	PRT-9	0 - 0.5	PRT-9^1-RMPS	ABCDEFG	482203.417	1345977.315
			PRT-9^1-L	H		
	PRT-A9	0 - 0.5	PRT-A9^1-R	A	TBD	TBD
	PRT-B9	0 - 0.5	PRT-B9^1-R	A	TBD	TBD
PRT-10	PRT-10	0 - 0.5	PRT-10^1-RMPS	ABCDEFG	482129.659	1346110.839
			PRT-10^1-L	H		
	PRT-A10	0 - 0.5	PRT-A10^1-R	A	TBD	TBD
	PRT-B10	0 - 0.5	PRT-B10^1-R	A	TBD	TBD
PRT-11	PRT-11	0 - 0.5	PRT-11^1-RMPS	ABCDEFG	481873.809	1346260.864
			PRT-11^1-L	H		
	PRT-A11	0 - 0.5	PRT-A11^1-RMPS	ABCDEFG	TBD	TBD
			PRT-A11^1-L	H		
	PRT-B11	0 - 0.5	PRT-B11^1-R	A	TBD	TBD
	PRT-C11	0 - 0.5	PRT-C11^1-R	A	TBD	TBD
	PRT-D11	0 - 0.5	PRT-D11^1-R	A	TBD	TBD
	PRT-E11	0 - 0.5	PRT-E11^1-R	A	TBD	TBD
PRT-12	PRT-12	0 - 0.5	PRT-12^1-RMPS	ABCDEFG	481773.707	1346235.315
			PRT-12^1-L	H		
	PRT-A12	0 - 0.5	PRT-A12^1-R	A	TBD	TBD
	PRT-B12	0 - 0.5	PRT-B12^1-R	A	TBD	TBD

APPENDIX B
SOIL SAMPLE LOCATIONS
PADDY'S RUN TRANSECTS

Transect	Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
PRT-13	PRT-13	0 - 0.5	PRT-13^1-RMPS	ABCDEFG	481689.544	1346218.435
			PRT-13^1-L	H		
	PRT-A13	0 - 0.5	PRT-A13^1-R	A	TBD	TBD
	PRT-B13	0 - 0.5	PRT-B13^1-R	A	TBD	TBD
PRT-14	PRT-14	0 - 0.5	PRT-14^1-RMPS	ABCDEFG	481671.065	1346176.49
			PRT-14^1-L	H		
	PRT-A14	0 - 0.5	PRT-A14^1-R	A	TBD	TBD
	PRT-B14	0 - 0.5	PRT-B14^1-R	A	TBD	TBD
PRT-15	PRT-15	0 - 0.5	PRT-15^1-RMPS	ABCDEFG	481467.069	1346162.648
			PRT-15^1-L	H		
	PRT-A15	0 - 0.5	PRT-A15^1-R	A	TBD	TBD
	PRT-B15	0 - 0.5	PRT-B15^1-R	A	TBD	TBD
PRT-16	PRT-16	0 - 0.5	PRT-16^1-RMPS	ABCDEFG	481384.052	1346215.491
			PRT-16^1-L	H		
	PRT-A16	0 - 0.5	PRT-A16^1-R	A	TBD	TBD
	PRT-B16	0 - 0.5	PRT-B16^1-R	A	TBD	TBD
PRT-17	PRT-17	0 - 0.5	PRT-17^1-RMPS	ABCDEFG	481026.386	1346432.601
			PRT-17^1-L	H		
	PRT-A17	0 - 0.5	PRT-A17^1-R	A	TBD	TBD
	PRT-B17	0 - 0.5	PRT-B17^1-R	A	TBD	TBD
PRT-18	PRT-18	0 - 0.5	PRT-18^1-RMPS	ABCDEFG	480937.283	1346512.296
			PRT-18^1-L	H		
	PRT-A18	0 - 0.5	PRT-A18^1-R	A	TBD	TBD
	PRT-B18	0 - 0.5	PRT-B18^1-R	A	TBD	TBD
PRT-19	PRT-19	0 - 0.5	PRT-19^1-RMPS	ABCDEFG	480729.009	1346667.147
			PRT-19^1-L	H		
	PRT-A19	0 - 0.5	PRT-A19^1-R	A	TBD	TBD
	PRT-B19	0 - 0.5	PRT-B19^1-R	A	TBD	TBD
PRT-20	PRT-20	0 - 0.5	PRT-20^1-RMPS	ABCDEFG	480600.128	1346722.803
			PRT-20^1-L	H		
	PRT-A20	0 - 0.5	PRT-A20^1-R	A	TBD	TBD
	PRT-B20	0 - 0.5	PRT-B20^1-R	A	TBD	TBD
PRT-21	PRT-21	0 - 0.5	PRT-21^1-RMPS	ABCDEFG	480520.137	1346716.023
			PRT-21^1-L	H		
	PRT-A21	0 - 0.5	PRT-A21^1-R	A	TBD	TBD
	PRT-B21	0 - 0.5	PRT-B21^1-R	A	TBD	TBD
PRT-22	PRT-22	0 - 0.5	PRT-22^1-RMPS	ABCDEFG	480298.678	1346624.662
			PRT-22^1-L	H		
	PRT-A22	0 - 0.5	PRT-A22^1-R	A	TBD	TBD
	PRT-B22	0 - 0.5	PRT-B22^1-R	A	TBD	TBD
PRT-23	PRT-23	0 - 0.5	PRT-23^1-RMPS	ABCDEFG	479581.19	1346441.477
			PRT-23^1-L	H		
	PRT-A23	0 - 0.5	PRT-A23^1-R	A	TBD	TBD
	PRT-B23	0 - 0.5	PRT-B23^1-R	A	TBD	TBD
PRT-24	PRT-24	0 - 0.5	PRT-24^1-RMPS	ABCDEFG	479159.534	1346656.46
			PRT-24^1-L	H		
	PRT-A24	0 - 0.5	PRT-A24^1-R	A	TBD	TBD
	PRT-B24	0 - 0.5	PRT-B24^1-R	A	TBD	TBD
PRT-25	PRT-25	0 - 0.5	PRT-25^1-RMPS	ABCDEFG	478343.113	1346584.421
			PRT-25^1-L	H		
	PRT-A25	0 - 0.5	PRT-A25^1-R	A	TBD	TBD
	PRT-B25	0 - 0.5	PRT-B25^1-R	A	TBD	TBD

APPENDIX B
SOIL SAMPLE LOCATIONS
PADDY'S RUN TRANSECTS

Transect	Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
PRT-26	PRT-26	0 - 0.5	PRT-26^1-RMPS	ABCDEFG	478258.97	1346972.864
			PRT-26^1-L	H		
	PRT-A26	0 - 0.5	PRT-A26^1-R	A	TBD	TBD
	PRT-B26	0 - 0.5	PRT-B26^1-R	A	TBD	TBD
PRT-27	PRT-27	0 - 0.5	PRT-27^1-RMPS	ABCDEFG	477839.467	1347357.092
			PRT-27^1-L	H		
	PRT-A27	0 - 0.5	PRT-A27^1-RMPS	ABCDEFG	TBD	TBD
			PRT-A27^1-L	H		
	PRT-B27	0 - 0.5	PRT-B27^1-R	A	TBD	TBD
	PRT-C27	0 - 0.5	PRT-C27^1-R	A	TBD	TBD
	PRT-D27	0 - 0.5	PRT-D27^1-R	A	TBD	TBD
	PRT-E27	0 - 0.5	PRT-E27^1-R	A	TBD	TBD
PRT-28	PRT-28	0 - 0.5	PRT-28^1-RMPS	ABCDEFG	477195.38	1347375.36
			PRT-28^1-L	H		
	PRT-A28	0 - 0.5	PRT-A28^1-R	A	TBD	TBD
	PRT-B28	0 - 0.5	PRT-B28^1-R	A	TBD	TBD
PRT-29	PRT-29	0 - 0.5	PRT-29^1-RMPS	ABCDEFG	476793.494	1348067.732
			PRT-29^1-L	H		
	PRT-A29	0 - 0.5	PRT-A29^1-R	A	TBD	TBD
	PRT-B29	0 - 0.5	PRT-B29^1-R	A	TBD	TBD
PRT-30	PRT-30	0 - 0.5	PRT-30^1-RMPS	ABCDEFG	476561.56	1348160.99
			PRT-30^1-L	H		
	PRT-A30	0 - 0.5	PRT-A30^1-R	A	TBD	TBD
	PRT-B30	0 - 0.5	PRT-B30^1-R	A	TBD	TBD
PRT-31	PRT-31	0 - 0.5	PRT-31^1-RMPS	ABCDEFG	476426.93	1348043.11
			PRT-31^1-L	H		
	PRT-A31	0 - 0.5	PRT-A31^1-R	A	TBD	TBD
	PRT-B31	0 - 0.5	PRT-B31^1-R	A	TBD	TBD
PRT-32	PRT-32	0 - 0.5	PRT-32^1-RMPS	ABCDEFG	476211.21	1347780.98
			PRT-32^1-L	H		
	PRT-A32	0 - 0.5	PRT-A32^1-R	A	TBD	TBD
	PRT-B32	0 - 0.5	PRT-B32^1-R	A	TBD	TBD

APPENDIX B
SOIL SAMPLE LOCATIONS
STORM SEWER OUTFALL DITCH TRANSECTS

Transect	Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
SSODT-1	SSODT-1	0 - 0.5	SSODT-1^1-RMPS	ABCDEFG	478609.608	1349149.65
			SSODT-1^1-L	H		
	SSODT-A1	0 - 0.5	SSODT-A1^1-R	A	TBD	TBD
	SSODT-B1	0 - 0.5	SSODT-B1^1-R	A	TBD	TBD
SSODT-2	SSODT-2	0 - 0.5	SSODT-2^1-RMPS	ABCDEFG	478529.985	1349101.632
			SSODT-2^1-L	H		
	SSODT-A2	0 - 0.5	SSODT-A2^1-R	A	TBD	TBD
	SSODT-B2	0 - 0.5	SSODT-B2^1-R	A	TBD	TBD
SSODT-3	SSODT-3	0 - 0.5	SSODT-3^1-RMPS	ABCDEFG	478443.268	1349044.766
			SSODT-3^1-L	H		
	SSODT-A3	0 - 0.5	SSODT-A3^1-R	A	TBD	TBD
	SSODT-B3	0 - 0.5	SSODT-B3^1-R	A	TBD	TBD
SSODT-4	SSODT-4	0 - 0.5	SSODT-4^1-RMPS	ABCDEFG	478379.879	1349012.679
			SSODT-4^1-L	H		
	SSODT-A4	0 - 0.5	SSODT-A4^1-R	A	TBD	TBD
	SSODT-B4	0 - 0.5	SSODT-B4^1-R	A	TBD	TBD
SSODT-5	SSODT-5	0 - 0.5	SSODT-5^1-RMPS	ABCDEFG	478330.673	1348988.241
			SSODT-5^1-L	H		
	SSODT-A5	0 - 0.5	SSODT-A5^1-R	A	TBD	TBD
	SSODT-B5	0 - 0.5	SSODT-B5^1-R	A	TBD	TBD
SSODT-6	SSODT-6	0 - 0.5	SSODT-6^1-RMPS	ABCDEFG	478234.093	1348973.662
			SSODT-6^1-L	H		
	SSODT-A6	0 - 0.5	SSODT-A6^1-RMPS	ABCDEFG	TBD	TBD
			SSODT-A6^1-L	H		
	SSODT-B6	0 - 0.5	SSODT-B6^1-R	A	TBD	TBD
	SSODT-C6	0 - 0.5	SSODT-C6^1-R	A	TBD	TBD
	SSODT-D6	0 - 0.5	SSODT-D6^1-R	A	TBD	TBD
	SSODT-E6	0 - 0.5	SSODT-E6^1-R	A	TBD	TBD
SSODT-7	SSODT-7	0 - 0.5	SSODT-7^1-RMPS	ABCDEFG	478158.047	1348983.406
			SSODT-7^1-L	H		
	SSODT-A7	0 - 0.5	SSODT-A7^1-R	A	TBD	TBD
	SSODT-B7	0 - 0.5	SSODT-B7^1-R	A	TBD	TBD
SSODT-8	SSODT-8	0 - 0.5	SSODT-8^1-RMPS	ABCDEFG	478061.178	1349032.954
			SSODT-8^1-L	H		
	SSODT-A8	0 - 0.5	SSODT-A8^1-R	A	TBD	TBD
	SSODT-B8	0 - 0.5	SSODT-B8^1-R	A	TBD	TBD
SSODT-9	SSODT-9	0 - 0.5	SSODT-9^1-RMPS	ABCDEFG	477948.381	1349056.991
			SSODT-9^1-L	H		
	SSODT-A9	0 - 0.5	SSODT-A9^1-R	A	TBD	TBD
	SSODT-B9	0 - 0.5	SSODT-B9^1-R	A	TBD	TBD
SSODT-10	SSODT-10	0 - 0.5	SSODT-10^1-RMPS	ABCDEFG	477834.453	1349075.511
			SSODT-10^1-L	H		
	SSODT-A10	0 - 0.5	SSODT-A10^1-R	A	TBD	TBD
	SSODT-B10	0 - 0.5	SSODT-B10^1-R	A	TBD	TBD
SSODT-11	SSODT-11	0 - 0.5	SSODT-11^1-RMPS	ABCDEFG	477742.615	1349090.458
			SSODT-11^1-L	H		
	SSODT-A11	0 - 0.5	SSODT-A11^1-R	A	TBD	TBD
	SSODT-B11	0 - 0.5	SSODT-B11^1-R	A	TBD	TBD
SSODT-12	SSODT-12	0 - 0.5	SSODT-12^1-RMPS	ABCDEFG	477636.714	1349060.317
			SSODT-12^1-L	H		
	SSODT-A12	0 - 0.5	SSODT-A12^1-R	A	TBD	TBD
	SSODT-B12	0 - 0.5	SSODT-B12^1-R	A	TBD	TBD

APPENDIX B
SOIL SAMPLE LOCATIONS
STORM SEWER OUTFALL DITCH TRANSECTS

Transect	Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
SSODT-13	SSODT-13	0 - 0.5	SSODT-13^1-RMPS	ABCDEFG	477548.539	1348892.75
			SSODT-13^1-L	H		
	SSODT-A13	0 - 0.5	SSODT-A13^1-R	A	TBD	TBD
	SSODT-B13	0 - 0.5	SSODT-B13^1-R	A	TBD	TBD
SSODT-14	SSODT-14	0 - 0.5	SSODT-14^1-RMPS	ABCDEFG	477471.204	1348768.936
			SSODT-14^1-L	H		
	SSODT-A14	0 - 0.5	SSODT-A14^1-R	A	TBD	TBD
	SSODT-B14	0 - 0.5	SSODT-B14^1-R	A	TBD	TBD
SSODT-15	SSODT-15	0 - 0.5	SSODT-15^1-RMPS	ABCDEFG	477383.428	1348744.288
			SSODT-15^1-L	H		
	SSODT-A15	0 - 0.5	SSODT-A15^1-RMPS	ABCDEFG	TBD	TBD
			SSODT-A15^1-L	H		
	SSODT-B15	0 - 0.5	SSODT-B15^1-R	A	TBD	TBD
	SSODT-C15	0 - 0.5	SSODT-C15^1-R	A	TBD	TBD
	SSODT-D15	0 - 0.5	SSODT-D15^1-R	A	TBD	TBD
	SSODT-E15	0 - 0.5	SSODT-E15^1-R	A	TBD	TBD
SSODT-16	SSODT-16	0 - 0.5	SSODT-16^1-RMPS	ABCDEFG	477223.922	1348832.118
			SSODT-16^1-L	H		
	SSODT-A16	0 - 0.5	SSODT-A16^1-R	A	TBD	TBD
	SSODT-B16	0 - 0.5	SSODT-B16^1-R	A	TBD	TBD
SSODT-17	SSODT-17	0 - 0.5	SSODT-17^1-RMPS	ABCDEFG	477038.194	1348669.803
			SSODT-17^1-L	H		
	SSODT-A17	0 - 0.5	SSODT-A17^1-R	A	TBD	TBD
	SSODT-B17	0 - 0.5	SSODT-B17^1-R	A	TBD	TBD
SSODT-18	SSODT-18	0 - 0.5	SSODT-18^1-RMPS	ABCDEFG	476974.178	1348491.729
			SSODT-18^1-L	H		
	SSODT-A18	0 - 0.5	SSODT-A18^1-R	A	TBD	TBD
	SSODT-B18	0 - 0.5	SSODT-B18^1-R	A	TBD	TBD
SSODT-19	SSODT-19	0 - 0.5	SSODT-19^1-RMPS	ABCDEFG	476887.462	1348309.166
			SSODT-19^1-L	H		
	SSODT-A19	0 - 0.5	SSODT-A19^1-R	A	TBD	TBD
	SSODT-B19	0 - 0.5	SSODT-B19^1-R	A	TBD	TBD
SSODT-20	SSODT-20	0 - 0.5	SSODT-20^1-RMPS	ABCDEFG	476767.909	1348149.181
			SSODT-20^1-L	H		
	SSODT-A20	0 - 0.5	SSODT-A20^1-RMPS	ABCDEFG	TBD	TBD
			SSODT-A20^1-L	H		
	SSODT-B20	0 - 0.5	SSODT-B20^1-R	A	TBD	TBD
	SSODT-C20	0 - 0.5	SSODT-C20^1-R	A	TBD	TBD
	SSODT-D20	0 - 0.5	SSODT-D20^1-R	A	TBD	TBD
	SSODT-E20	0 - 0.5	SSODT-E20^1-R	A	TBD	TBD
SSODT-21	SSODT-21	0 - 0.5	SSODT-21^1-RMPS	ABCDEFG	478104.18	1349367.82
			SSODT-21^1-L	H		
	SSODT-A21	0 - 0.5	SSODT-A21^1-R	A	TBD	TBD
	SSODT-B21	0 - 0.5	SSODT-B21^1-R	A	TBD	TBD
SSODT-22	SSODT-22	0 - 0.5	SSODT-22^1-RMPS	ABCDEFG	477953.65	1349328.27
			SSODT-22^1-L	H		
	SSODT-A22	0 - 0.5	SSODT-A22^1-R	A	TBD	TBD
	SSODT-B22	0 - 0.5	SSODT-B22^1-R	A	TBD	TBD
SSODT-23	SSODT-23	0 - 0.5	SSODT-23^1-RMPS	ABCDEFG	477807.01	1349230.56
			SSODT-23^1-L	H		
	SSODT-A23	0 - 0.5	SSODT-A23^1-R	A	TBD	TBD
	SSODT-B23	0 - 0.5	SSODT-B23^1-R	A	TBD	TBD

APPENDIX B
SOIL SAMPLE LOCATIONS
PILOT PLANT DRAINAGE DITCH TRANSECTS

Transect	Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
PPDDT-1	PPDDT-1	0 - 0.5	PPDDT-1^1-RMPS	ABCDEFG	479864.66	1347663.55
			PPDDT-1^1-L	H		
	PPDDT-A1	0 - 0.5	PPDDT-A1^1-R	A	TBD	TBD
	PPDDT-B1	0 - 0.5	PPDDT-B1^1-R	A	TBD	TBD
PPDDT-2	PPDDT-2	0 - 0.5	PPDDT-2^1-RMPS	ABCDEFG	480071.09	1347335.33
			PPDDT-2^1-L	H		
	PPDDT-A2	0 - 0.5	PPDDT-A2^1-R	A	TBD	TBD
	PPDDT-B2	0 - 0.5	PPDDT-B2^1-R	A	TBD	TBD
PPDDT-3	PPDDT-3	0 - 0.5	PPDDT-3^1-RMPS	ABCDEFG	480089.86	1346984.14
			PPDDT-3^1-L	H		
	PPDDT-A3	0 - 0.5	PPDDT-A3^1-R	A	TBD	TBD
	PPDDT-B3	0 - 0.5	PPDDT-B3^1-R	A	TBD	TBD
PPDDT-4	PPDDT-4	0 - 0.5	PPDDT-4^1-RMPS	ABCDEFG	479988.52	1346780.64
			PPDDT-4^1-L	H		
	PPDDT-A4	0 - 0.5	PPDDT-A4^1-R	A	TBD	TBD
	PPDDT-B4	0 - 0.5	PPDDT-B4^1-R	A	TBD	TBD
PPDDT-5	PPDDT-5	0 - 0.5	PPDDT-5^1-RMPS	ABCDEFG	479909.7	1346617.47
			PPDDT-5^1-L	H		
	PPDDT-A5	0 - 0.5	PPDDT-A5^1-RMPS	ABCDEFG	TBD	TBD
			PPDDT-A5^1-L	H		
	PPDDT-B5	0 - 0.5	PPDDT-B5^1-R	A	TBD	TBD
	PPDDT-C5	0 - 0.5	PPDDT-C5^1-R	A	TBD	TBD
	PPDDT-D5	0 - 0.5	PPDDT-D5^1-R	A	TBD	TBD
	PPDDT-E5	0 - 0.5	PPDDT-E5^1-R	A	TBD	TBD

APPENDIX B
SOIL SAMPLE LOCATIONS
PADDY'S RUN CHANNEL

Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
PRC-1	0 - 0.5	PRC-1^1-RMPS	ABCDEFG	482574.431	1345906.964
		PRC-1^1-L	H		
PRC-2	0 - 0.5	PRC-2^1-RMPS	ABCDEFG	482574.43	1345910.16
		PRC-2^1-L	H		
PRC-3	0 - 0.5	PRC-3^1-RMPS	ABCDEFG	479042.033	1346737.881
		PRC-3^1-L	H		
PRC-4	0 - 0.5	PRC-4^1-RMPS	ABCDEFG	479042.03	1346736.08
		PRC-4^1-L	H		
PRC-5	0 - 0.5	PRC-5^1-RMPS	ABCDEFG	478987.064	1346832.823
		PRC-5^1-L	H		
PRC-6	0 - 0.5	PRC-6^1-RMPS	ABCDEFG	478987.06	1346836.02
		PRC-6^1-L	H		

APPENDIX B
SOIL SAMPLE LOCATIONS
STORM SEWER OUTFALL DITCH CHANNEL

Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
SSODC-1	0 - 0.5	SSODC-1^1-RMPS	ABCDEFG	478170.394	1348958.843
		SSODC-1^1-L	H		
SSODC-2	0 - 0.5	SSODC-2^1-RMPS	ABCDEFG	478170.39	1348952.04
		SSODC-2^1-L	H		
SSODC-3	0 - 0.5	SSODC-3^1-RMPS	ABCDEFG	478091.937	1349008.665
		SSODC-3^1-L	H		
SSODC-4	0 - 0.5	SSODC-4^1-RMPS	ABCDEFG	478091.93	1349001.86
		SSODC-4^1-L	H		
SSODC-5	0 - 0.5	SSODC-5^1-RMPS	ABCDEFG	477489.352	1348739.55
		SSODC-5^1-L	H		
SSODC-6	0 - 0.5	SSODC-6^1-RMPS	ABCDEFG	477491.85	1348733.42
		SSODC-6^1-L	H		
SSODC-7	0 - 0.5	SSODC-7^1-RMPS	ABCDEFG	477437.923	1348715.235
		SSODC-7^1-L	H		
SSODC-8	0 - 0.5	SSODC-8^1-RMPS	ABCDEFG	477440.42	1348709.1
		SSODC-8^1-L	H		
SSODC-9	0 - 0.5	SSODC-9^1-RMPS	ABCDEFG	477804.28	1349110.49
		SSODC-9^1-L	H		
SSODC-10	0 - 0.5	SSODC-10^1-RMPS	ABCDEFG	477765.26	1349151.72
		SSODC-10^1-L	H		

APPENDIX B
SOIL SAMPLE LOCATIONS
PADDY'S RUN DEBRIS

Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
PRD-1	0 - 0.5	PRD-1^1-RMPS	ABCDEFG	482495.504	1345873.949
		PRD-1^1-L	H		
PRD-2	0 - 0.5	PRD-2^1-RMPS	ABCDEFG	482491.115	1345849.545
		PRD-2^1-L	H		
PRD-3	0 - 0.5	PRD-3^1-RMPS	ABCDEFG	482469.854	1345881.257
		PRD-3^1-L	H		
PRD-4	0 - 0.5	PRD-4^1-RMPS	ABCDEFG	482347.989	1345929.242
		PRD-4^1-L	H		
PRD-5	0 - 0.5	PRD-5^1-RMPS	ABCDEFG	482161.847	1346098.168
		PRD-5^1-L	H		
PRD-6	0 - 0.5	PRD-6^1-RMPS	ABCDEFG	481633.502	1346177.624
		PRD-6^1-L	H		
PRD-7	0 - 0.5	PRD-7^1-RMPS	ABCDEFG	481439.669	1346174.445
		PRD-7^1-L	H		
PRD-8	0 - 0.5	PRD-8^1-RMPS	ABCDEFG	481270.622	1346306.185
		PRD-8^1-L	H		
PRD-9	0 - 0.5	PRD-9^1-RMPS	ABCDEFG	481183.478	1346341.987
		PRD-9^1-L	H		
PRD-10	0 - 0.5	PRD-10^1-RMPS	ABCDEFG	481107.35	1346372.88
		PRD-10^1-L	H		
PRD-11	0 - 0.5	PRD-11^1-RMPS	ABCDEFG	480328.901	1346579.052
		PRD-11^1-L	H		
PRD-12	0 - 0.5	PRD-12^1-RMPS	ABCDEFG	479600.829	1346405.885
		PRD-12^1-L	H		
PRD-13	0 - 0.5	PRD-13^1-RMPS	ABCDEFG	479480.02	1346420.05
		PRD-13^1-L	H		
PRD-14	0 - 0.5	PRD-14^1-RMPS	ABCDEFG	479185.373	1346640.527
		PRD-14^1-L	H		
PRD-15	0 - 0.5	PRD-15^1-RMPS	ABCDEFG	478660.115	1346737.446
		PRD-15^1-L	H		
PRD-16	0 - 0.5	PRD-16^1-RMPS	ABCDEFG	477502.66	1347352.24
		PRD-16^1-L	H		
PRD-17	0 - 0.5	PRD-17^1-RMPS	ABCDEFG	477170.165	1347551.102
		PRD-17^1-L	H		
PRD-18	0 - 0.5	PRD-18^1-RMPS	ABCDEFG	476732.896	1348125.886
		PRD-18^1-L	H		
PRD-19	0 - 0.5	PRD-19^1-RMPS	ABCDEFG	476493.947	1348139.806
		PRD-19^1-L	H		
PRD-20	0 - 0.5	PRD-20^1-RMPS	ABCDEFG	476460.603	1348067.226
		PRD-20^1-L	H		
PRD-21	0 - 0.5	PRD-21^1-RMPS	ABCDEFG	476389.652	1347990.831
		PRD-21^1-L	H		
PRD-22	0 - 0.5	PRD-22^1-RMPS	ABCDEFG	476324.35	1347899.5
		PRD-22^1-L	H		

APPENDIX B
SOIL SAMPLE LOCATIONS
STORM SEWER OUTFALL DITCH DEBIRS

Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
SSODD-1	0 - 0.5	SSODD-1^1-RMPS	ABCDEFG	477555.75	1348818.463
		SSODD-1^1-L	H		
SSODD-2	0 - 0.5	SSODD-2^1-RMPS	ABCDEFG	476978.177	1348608.133
		SSODD-2^1-L	H		
SSODD-3	0 - 0.5	SSODD-3^1-RMPS	ABCDEFG	476975.912	1348541.284
		SSODD-3^1-L	H		
SSODD-4	0 - 0.5	SSODD-4^1-RMPS	ABCDEFG	476836.485	1348283.159
		SSODD-4^1-L	H		
SSODD-5	0 - 0.5	SSODD-5^1-RMPS	ABCDEFG	476786.802	1348264.7
		SSODD-5^1-L	H		

APPENDIX B
SOIL SAMPLE LOCATIONS
STORM SEWER OUTFALL DITCH FLOOD PLAIN

Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
SSODF-1	0 - 0.5	SSODF-1^1-RMPS	ABCDEFG	477376.27	1348793.15
		SSODF-1^1-L	H		
SSODF-2	0 - 0.5	SSODF-2^1-RMPS	ABCDEFG	477353.05	1348821.82
		SSODF-2^1-L	H		

APPENDIX B
SOIL SAMPLE LOCATIONS
OLD PADDY'S RUN

Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
OPR-1	0 - 0.5	OPR-1^1-RMPS	ABCDEFG	479855.14	1346066.14
		OPR-1^1-L	H		
OPR-2	0 - 0.5	OPR-2^1-RMPS	ABCDEFG	479848.6	1346162.49
		OPR-2^1-L	H		
OPR-3	0 - 0.5	OPR-3^1-RMPS	ABCDEFG	479866.59	1346267.25
		OPR-3^1-L	H		
OPR-4	0 - 0.5	OPR-4^1-RMPS	ABCDEFG	479915.67	1346470
		OPR-4^1-L	H		
OPR-5	0 - 0.5	OPR-5^1-RMPS	ABCDEFG	479580.3	1346048.16
		OPR-5^1-L	H		
OPR-6	0 - 0.5	OPR-6^1-RMPS	ABCDEFG	479578.42	1346139.82
		OPR-6^1-L	H		
OPR-7	0 - 0.5	OPR-7^1-RMPS	ABCDEFG	479567.21	1346270.52
		OPR-7^1-L	H		
OPR-8	0 - 0.5	OPR-8^1-RMPS	ABCDEFG	479557.39	1346380.07
		OPR-8^1-L	H		
OPR-9	0 - 0.5	OPR-9^1-RMPS	ABCDEFG	479303.82	1346144.62
		OPR-9^1-L	H		
OPR-10	0 - 0.5	OPR-10^1-RMPS	ABCDEFG	479246.22	1346327.02
		OPR-10^1-L	H		
OPR-11	0 - 0.5	OPR-11^1-RMPS	ABCDEFG	479197.89	1346491.25
		OPR-11^1-L	H		

APPENDIX B
IEMP SAMPLE LOCATIONS

Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
IEMP-PN1	0 - 0.5	IEMP-PN1^1-R	A	476732.896	1348125.89
IEMP-PN2	0 - 0.5	IEMP-PN2^1-R	A	477372.42	1347283.61
IEMP-PN3	0 - 0.5	IEMP-PN3^1-R	A	479873.25	1346566.73
IEMP-PN4	0 - 0.5	IEMP-PN4^1-R	A	480733.513	1346657.99
IEMP-PN5	0 - 0.5	IEMP-PN5^1-R	A	482154.041	1346088.08
IEMP-D1	0 - 0.5	IEMP-D1^1-R	A	476900.019	1348333.63
IEMP-D2	0 - 0.5	IEMP-D2^1-R	A	476964.512	1348623.69
IEMP-D3	0 - 0.5	IEMP-D3^1-R	A	477221.423	1348844.36
IEMP-D4	0 - 0.5	IEMP-D4^1-R	A	477425.237	1348730.31
IEMP-D5	0 - 0.5	IEMP-D5^1-R	A	477597.352	1349027.7
IEMP-PS1	0 - 0.5	IEMP-PS1^1-R	A	476606.098	1348139.23
IEMP-PS2	0 - 0.5	IEMP-PS2^1-R	A	476271.438	1347826.84
IEMP-PS3	0 - 0.5	IEMP-PS3^1-R	A	NA (Offsite)	NA (Offsite)
IEMP-P1	0 - 0.5	IEMP-P1^1-R	A	NA (Offsite)	NA (Offsite)
IEMP-G2	0 - 0.5	IEMP-G2^1-U	I	NA (Offsite)	NA (Offsite)
IEMP-G4	0 - 0.5	IEMP-G4^1-U	I	NA (Offsite)	NA (Offsite)

APPENDIX B
SOIL SAMPLE LOCATIONS
REAL-TIME BIASED SAMPLING

Location	Sample Interval (feet)	Sample ID	TAL	Northing	Easting
RTB-1	0 - 0.5	RTB-1^1-R	A	478141	1348985
	0.5 - 1.0	RTB-1^2-R	A		
	1.0 - 1.5	RTB-1^3-R	A		
RTB-2	0 - 0.5	RTB-2^1-R	A	477762	1349082
	0.5 - 1.0	RTB-2^2-R	A		
	1.0 - 1.5	RTB-2^3-R	A		
RTB-3	0 - 0.5	RTB-3^1-R	A	479194	1346351
	0.5 - 1.0	RTB-3^2-R	A		
	1.0 - 1.5	RTB-3^3-R	A		

APPENDIX C

TARGET ANALYTE LISTS

APPENDIX C
TARGET ANALYTE LISTS

TAL A
20300-PSP-0013-A

COMPONENT	MDL
Total Uranium	8 mg/kg
Radium-226	0.17 pCi/g
Radium-228	0.18 pCi/g
Thorium-228	0.17 pCi/g
Thorium-232	0.15 pCi/g
Thorium-230	28 pCi/g

TAL B
20300-PSP-0013-B

COMPONENT	MDL
Technetium-99	2.91 pCi/g

TAL C
20300-PSP-0013-C

COMPONENT	MDL
Cesium-137	0.14 pCi/g
Lead-210	3.8 pCi/g
Neptunium-237	0.32 pCi/g
Plutonium-238	7.8 pCi/g
Strontium-90	1.4 pci/g

TAL D
20300-PSP-0013-D

COMPONENT	MDL
Antimony	1 mg/kg
Arsenic	1.2 mg/kg
Beryllium	0.15 mg/kg
Cadmium	0.5 mg/kg
Lead	20 mg/kg
Manganese	150 mg/kg
Molybdenum	1 mg/kg
Silver	1 mg/kg

TAL E
20300-PSP-0013-E

COMPONENT	MDL
Fluoride	0.1 mg/kg

APPENDIX C
TARGET ANALYTE LISTS

TAL F
20300-PSP-0013-F

COMPONENT	MDL
Aroclor-1254	0.013 mg/kg
Aroclor-1260	0.013 mg/kg
Dieldrin	0.0015 mg/kg

TAL G
20300-PSP-0013-G

COMPONENT	MDL
Benzo(a)anthracene	0.1 mg/kg
Benzo(a)pyrene	0.1 mg/kg
Benzo(b)fluoranthene	0.1 mg/kg
Benzo(g,h,i)perlene	0.1 mg/kg
Benzo(k)fluoranthene	0.1 mg/kg
Chrysene	0.1 mg/kg
Dibenzo(a,h)anthracene	0.0088 mg/kg
Fluoranthene	1 mg/kg
Indeno(1,2,3-cd)pyrene	0.1 mg/kg
Phenantrene	0.5 mg/kg
Pyrene	1 mg/kg

TAL H
20300-PSP-0013-H

COMPONENT	MDL
1,1-Dichloroethene	0.041 mg/kg
Bromodichloromethane	0.4 mg/kg
Tetrachloroethene	0.36 mg/kg
Trichloroethene	2.5 mg/kg

TAL I
20300-PSP-0013-I

COMPONENT	MDL
Total Uranium	8 mg/kg

APPENDIX D

CROSS-SECTIONS FOR ALL TRANSECT SAMPLNG

APPENDIX D

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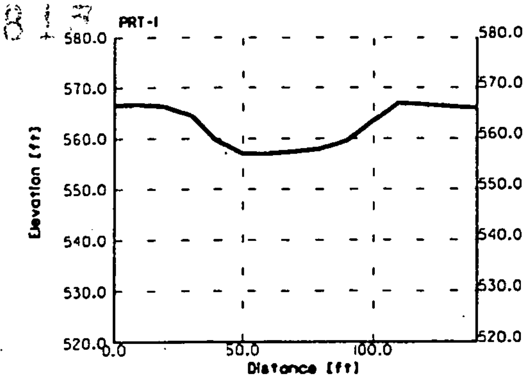

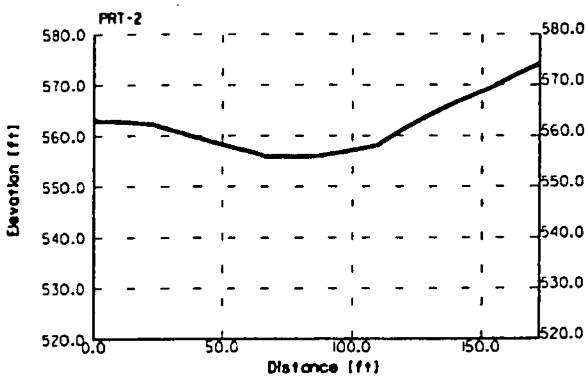

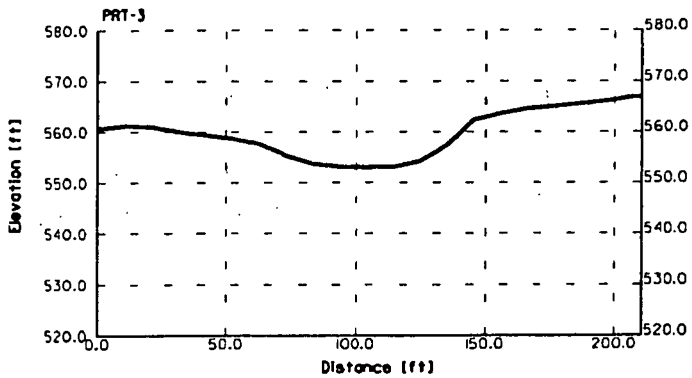

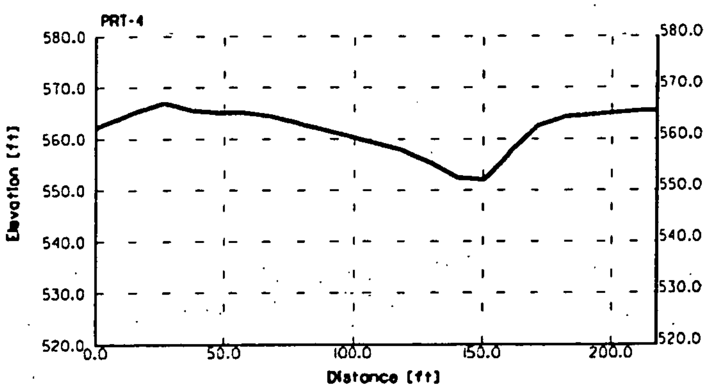

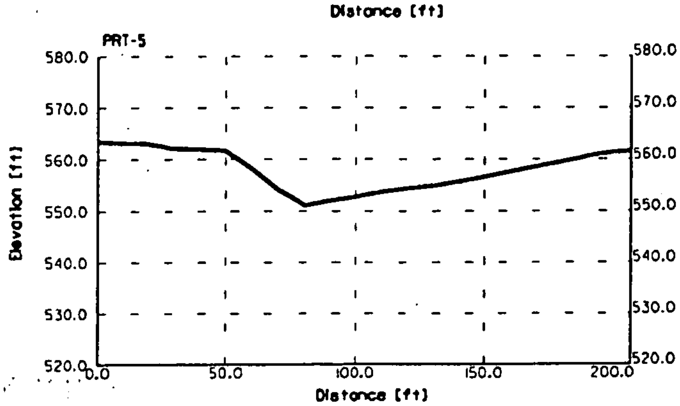

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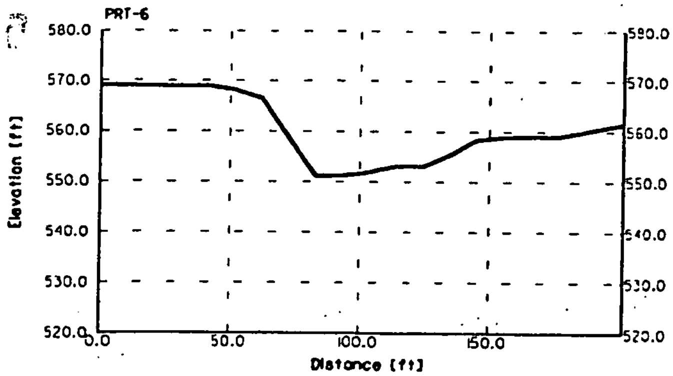
PRT-6
Elevation (ft)
Distance (ft)
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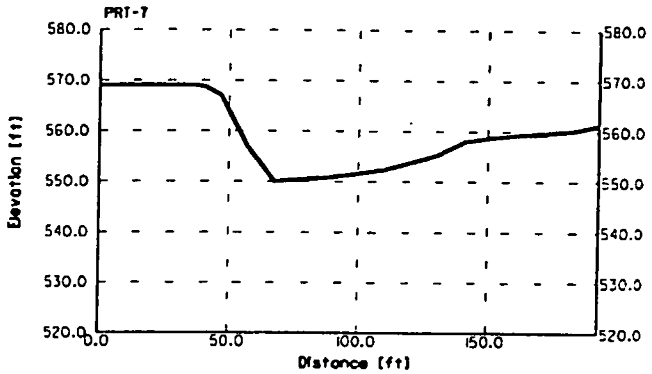
550.0
540.0
530.0
520.0
0.0
50.0
100.0
150.0


PRT-7
Elevation (ft)
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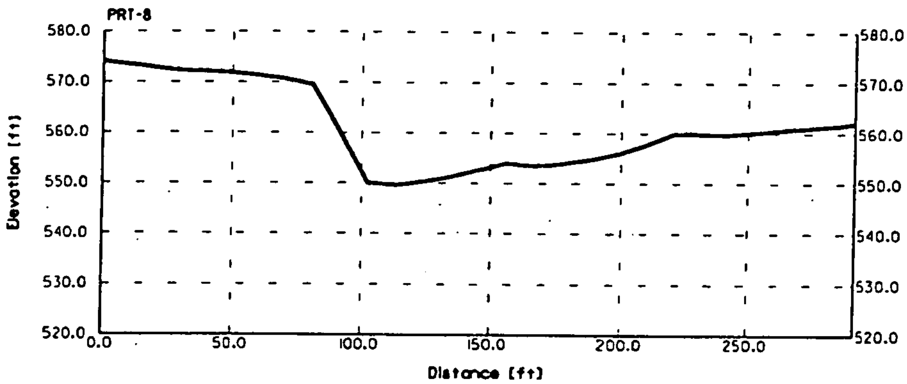
PRT-8
Elevation (ft)
Distance (ft)
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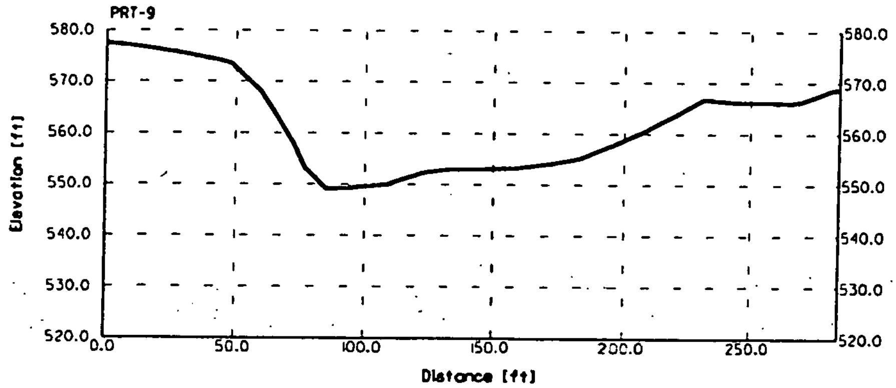
PRT-9
Elevation (ft)
Distance (ft)
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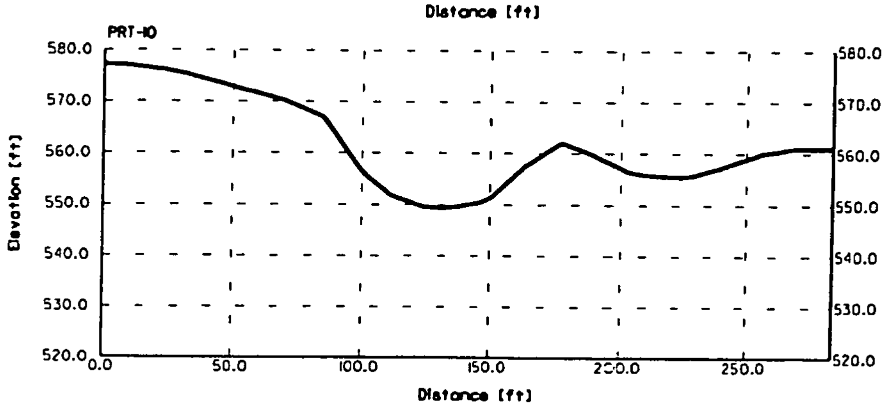
PRT-10
Elevation (ft)
Distance (ft)
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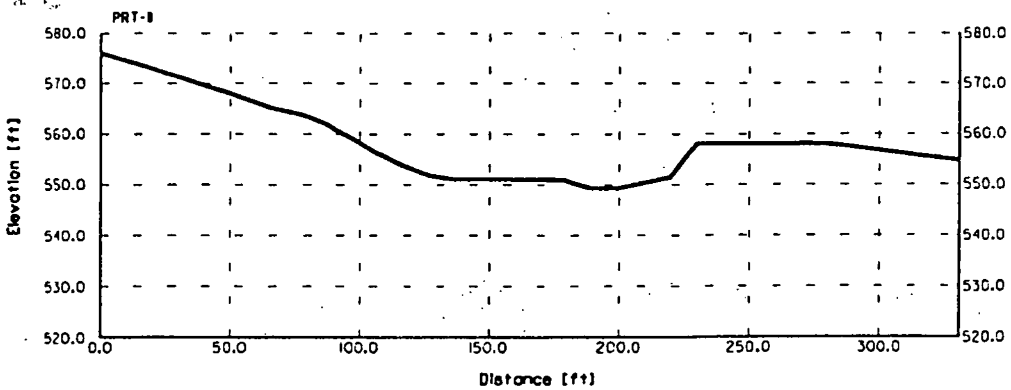
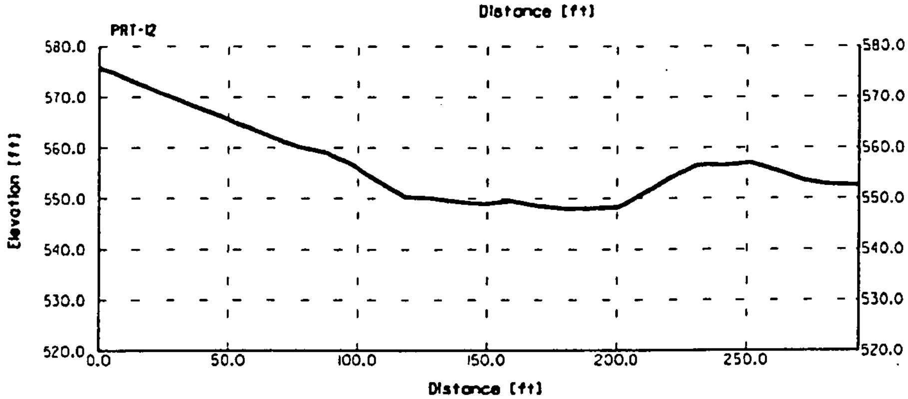

PRT-11
Elevation (ft)
Distance (ft)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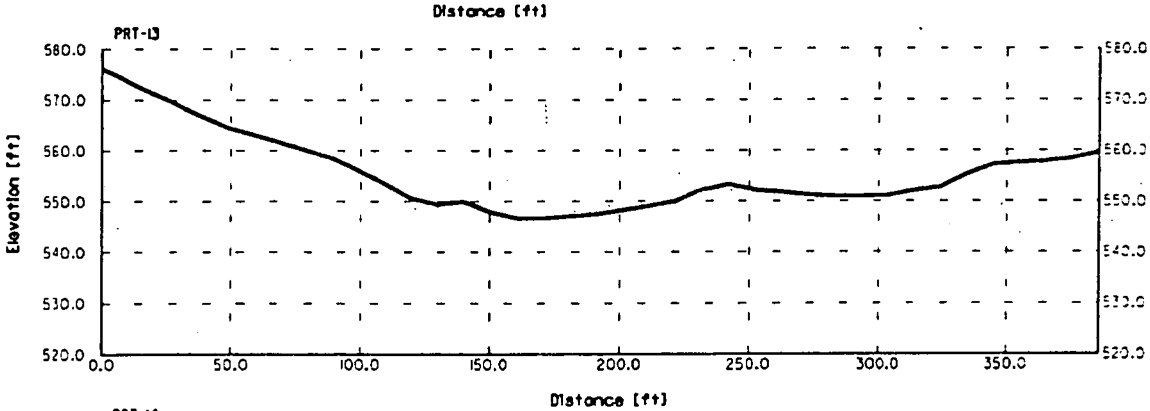
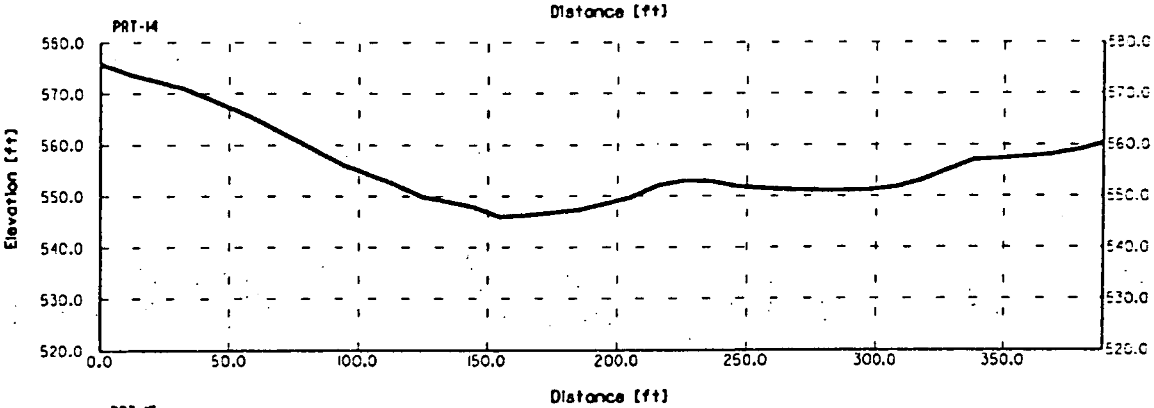
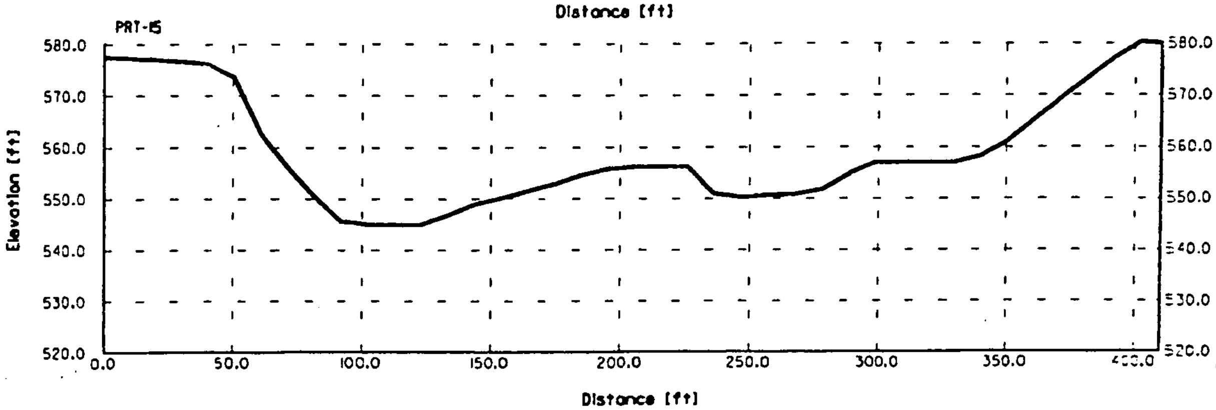
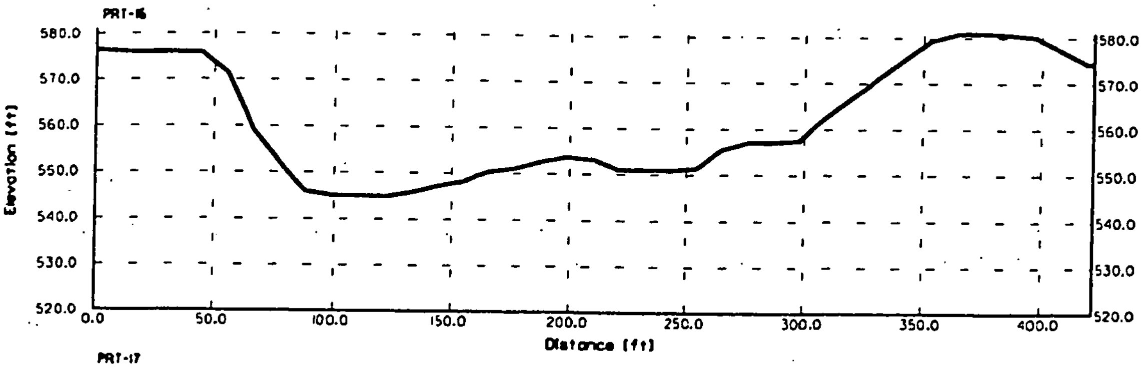
Elevation (ft)
Distance (ft)

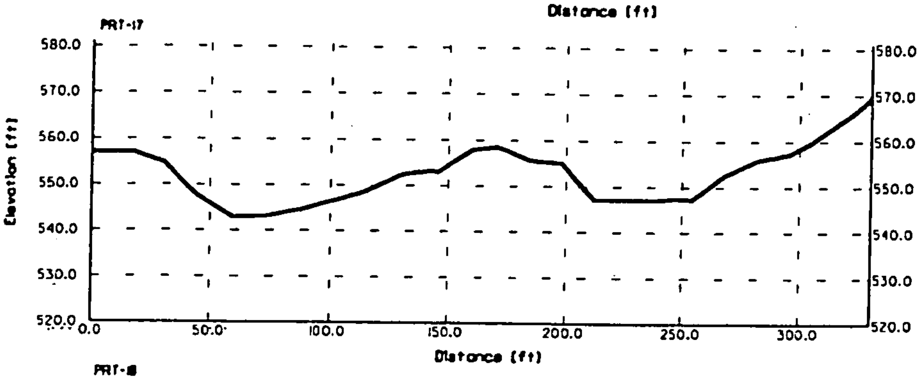

PRT-13
Elevation (ft)
Distance (ft)

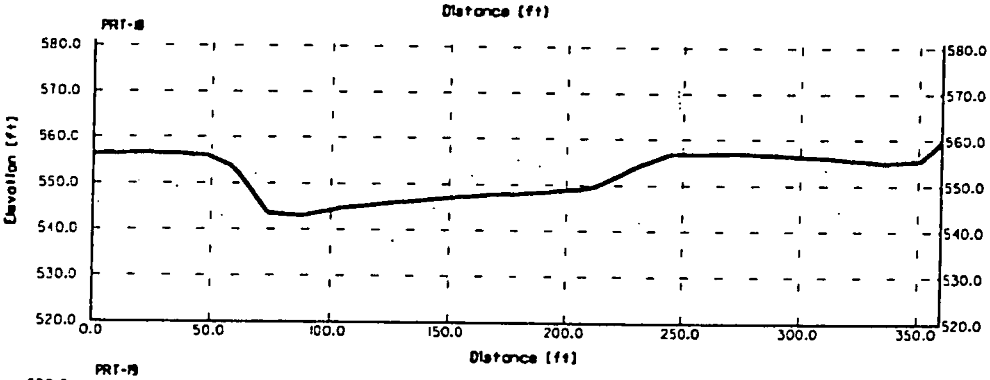

PRT-14
Elevation (ft)
Distance (ft)

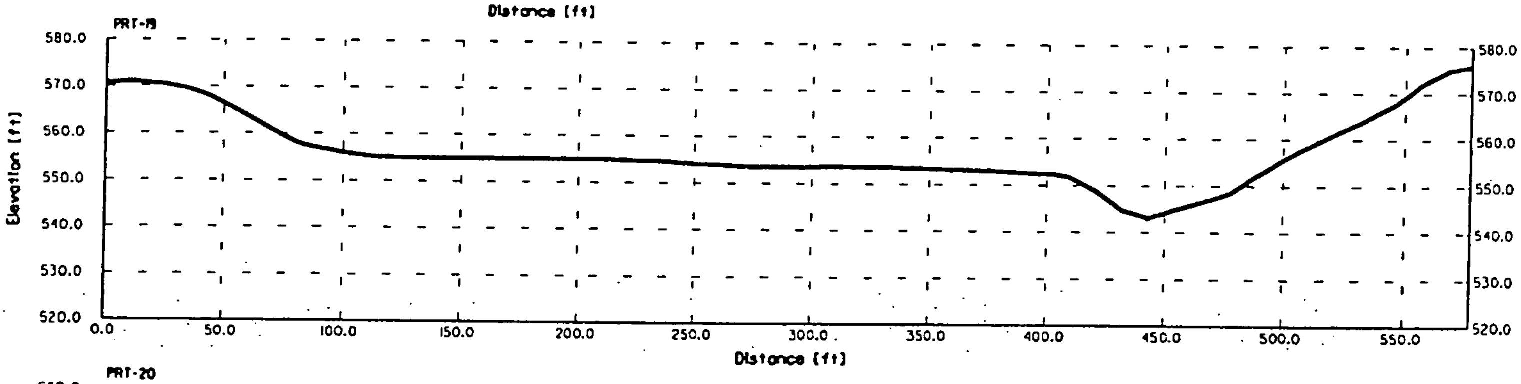

PRT-15
Elevation (ft)
Distance (ft)

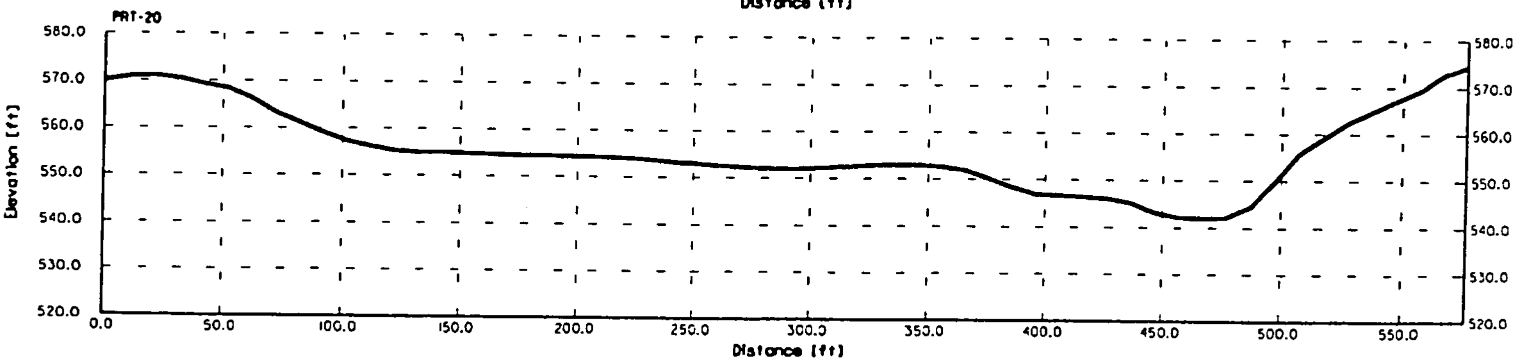
APPENDIX D


PRT-16
Elevation (ft)
Distance (ft)

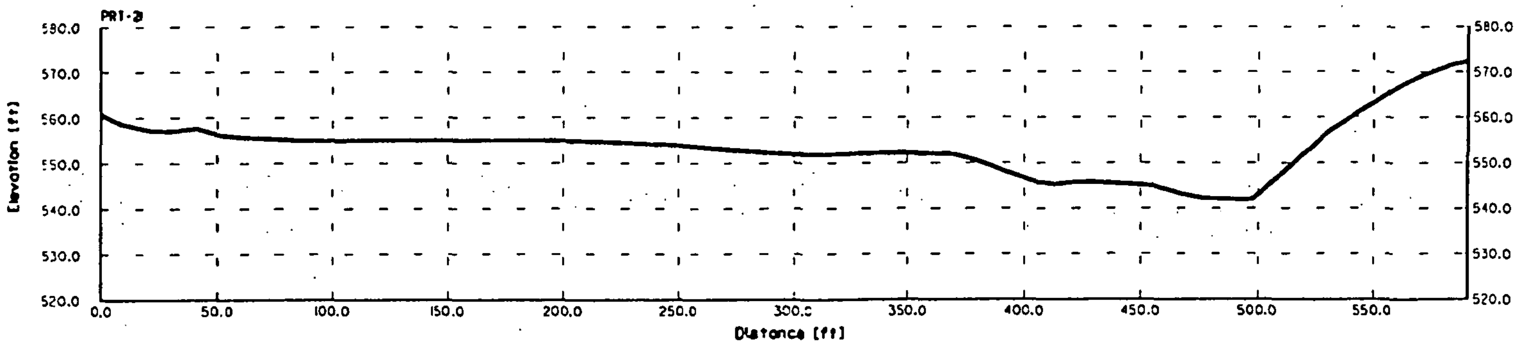

PRT-17
Elevation (ft)
Distance (ft)


PRT-18
Elevation (ft)
Distance (ft)


PRT-19
Elevation (ft)
Distance (ft)


PRT-20
Elevation (ft)
Distance (ft)

APPENDIX D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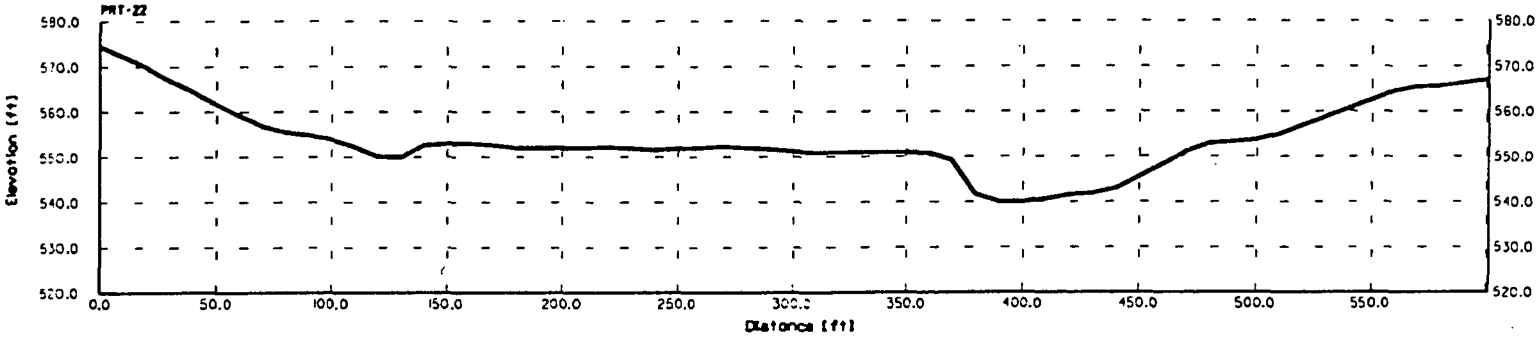
Elevation (ft)
Distance (ft)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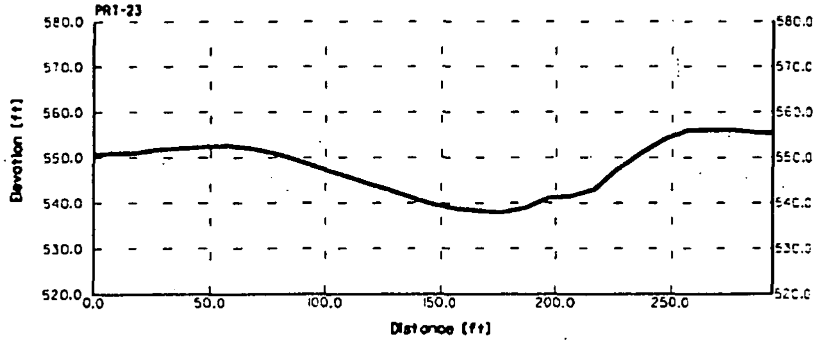
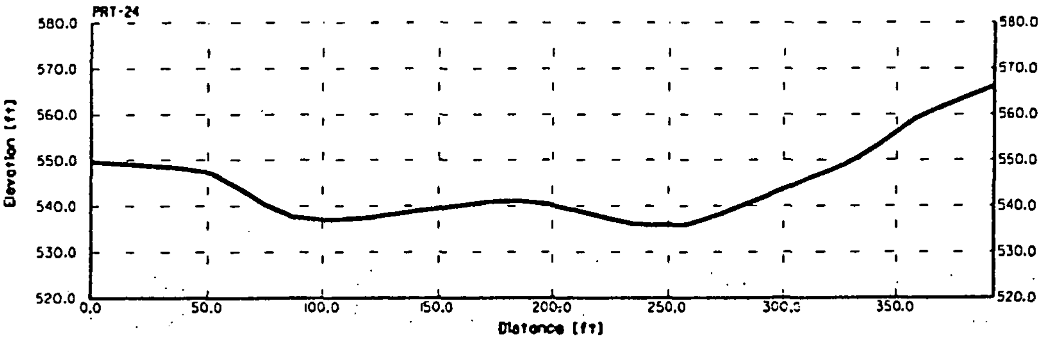
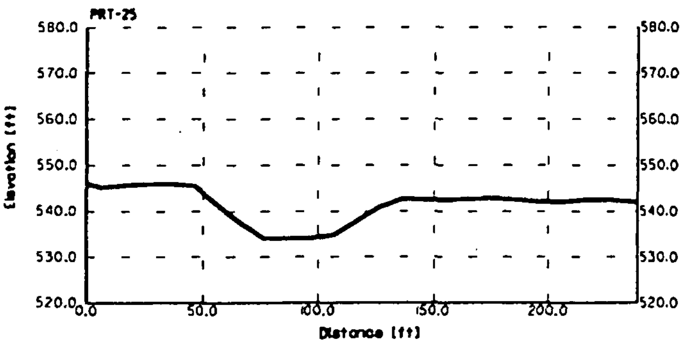
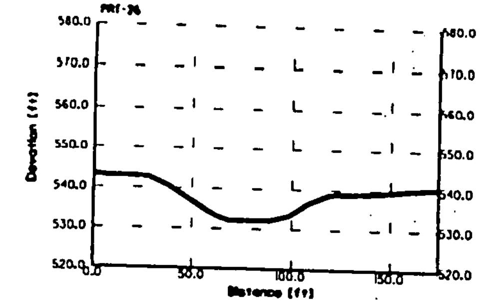
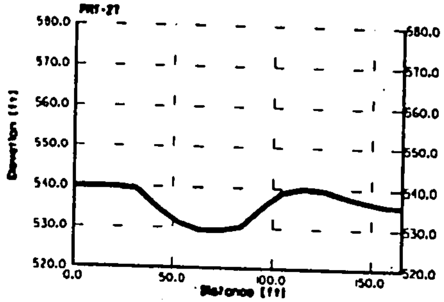
Elevation (ft)
Distance (ft)


PRT-23
Elevation (ft)
Distance (ft)


PRT-24
Elevation (ft)
Distance (ft)


PRT-25
Elevation (ft)
Distance (ft)


Elevation (ft)
Distance (ft)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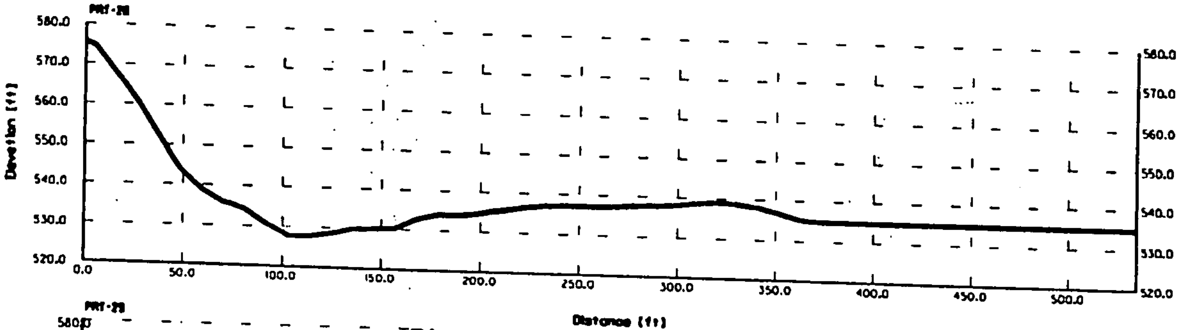
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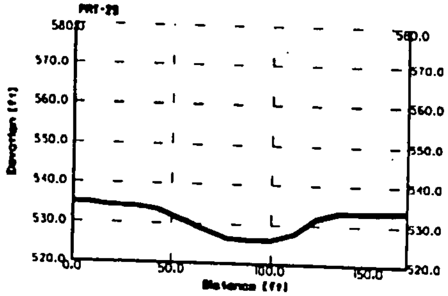
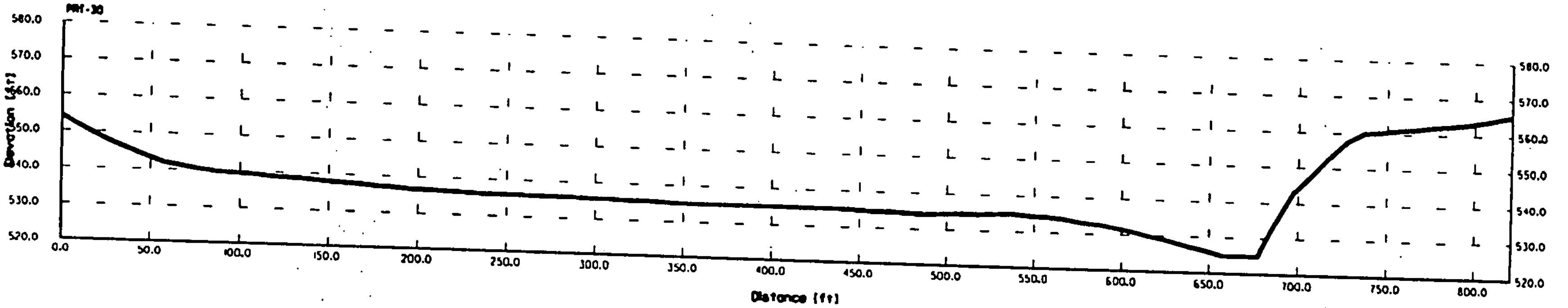
Distance (ft)


Elevation (ft)
Distance (ft)


Elevation (ft)
Distance (ft)

5187

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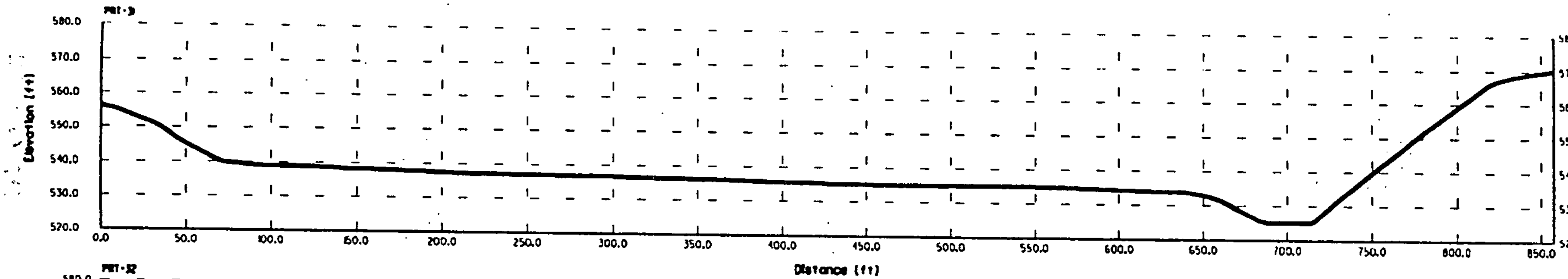

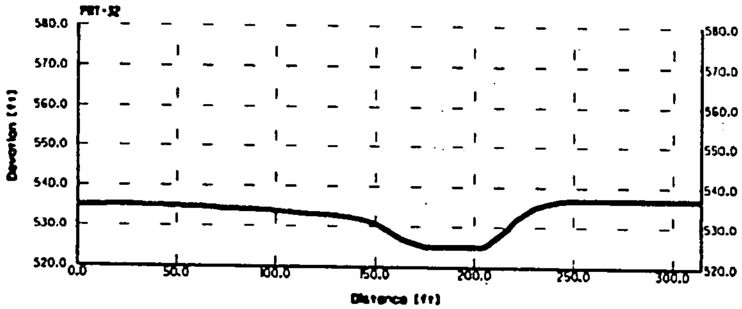

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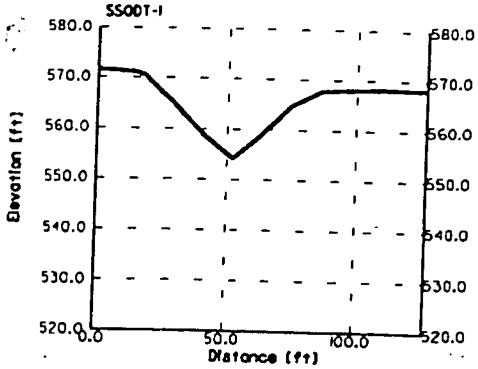
SS00T-1
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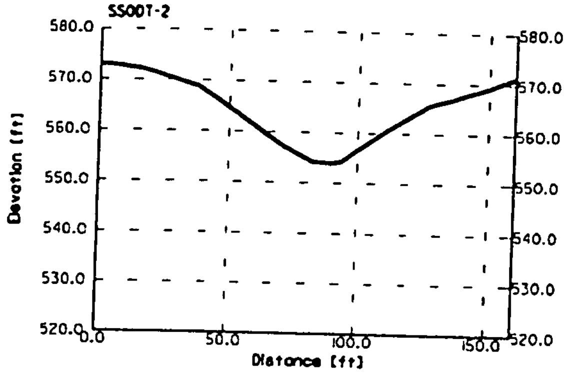
SS00T-2
Elevation (ft)
Distance (ft)
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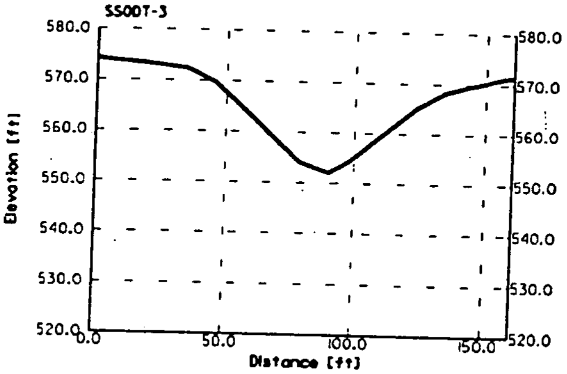
150.0


SS00T-3
Elevation (ft)
Distance (ft)
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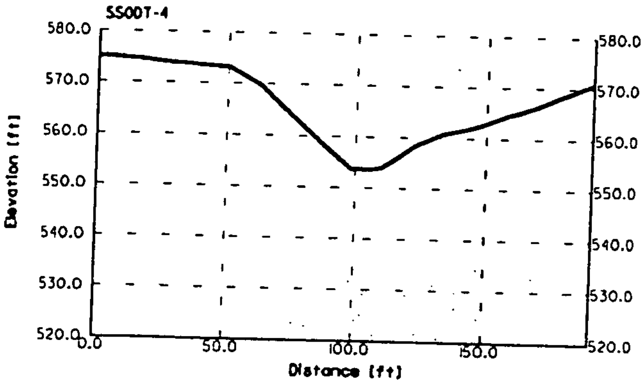
150.0


SS00T-4
Elevation (ft)
Distance (ft)
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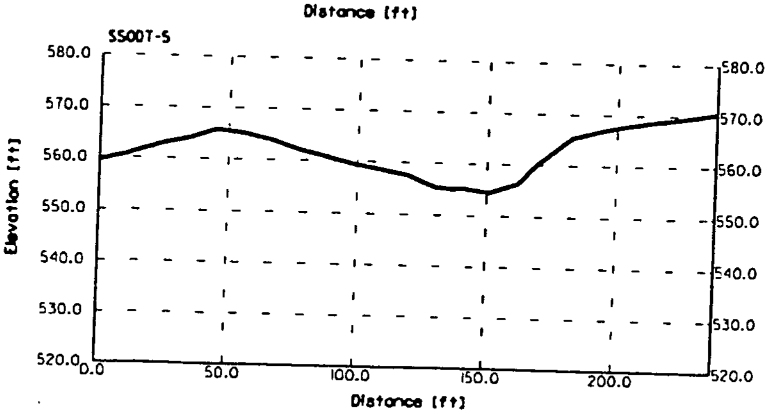
SS00T-5
Elevation (ft)
Distance (ft)
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200.0

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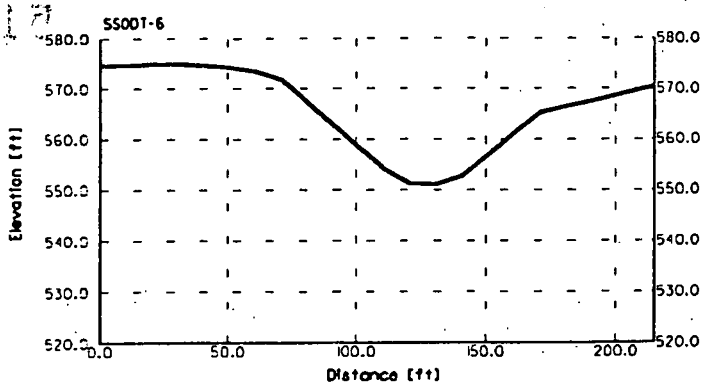
SSODT-6
Elevation (ft)
Distance (ft)
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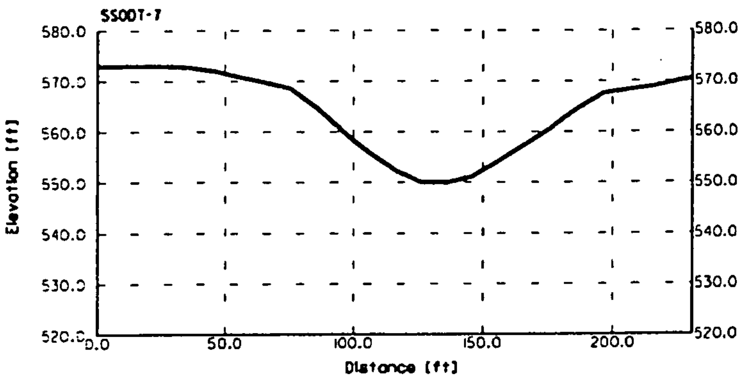
SSODT-7
Elevation (ft)
Distance (ft)
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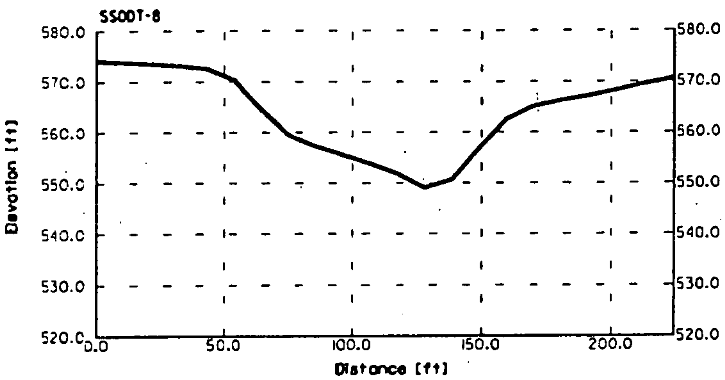
SSODT-8
Elevation (ft)
Distance (ft)
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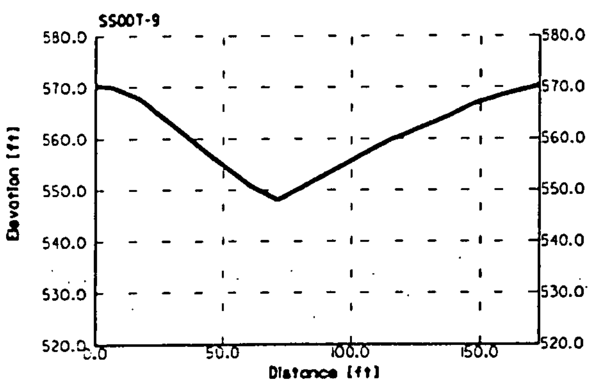
SSODT-9
Elevation (ft)
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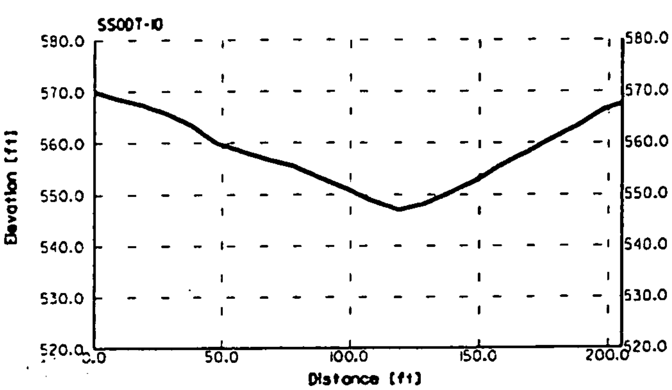
SSODT-10
Elevation (ft)
Distance (ft)
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150.0
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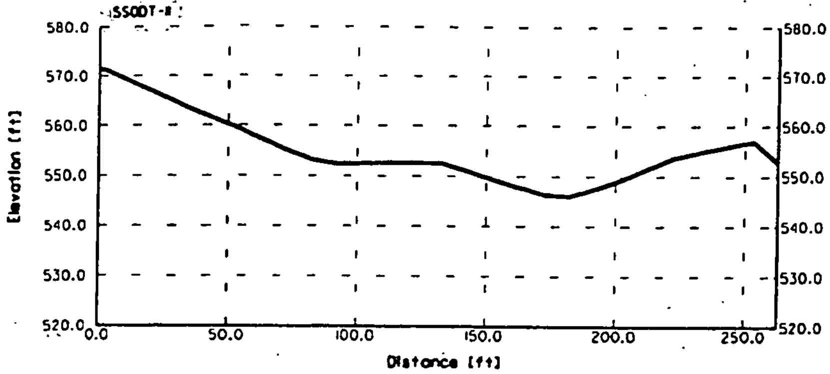
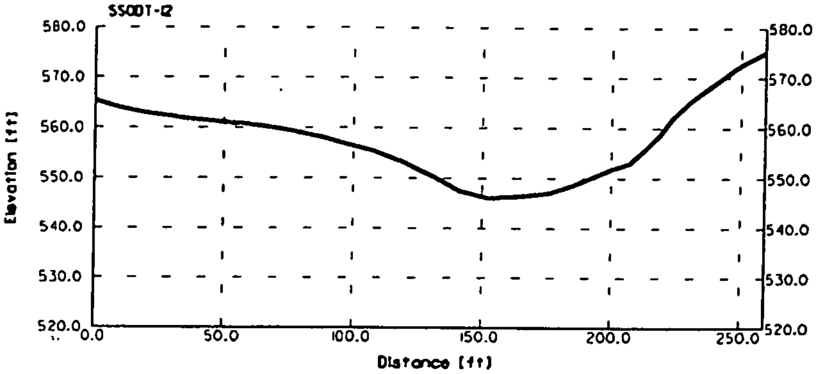

SSODT-11
Elevation (ft)
Distance (ft)


SSODT-12
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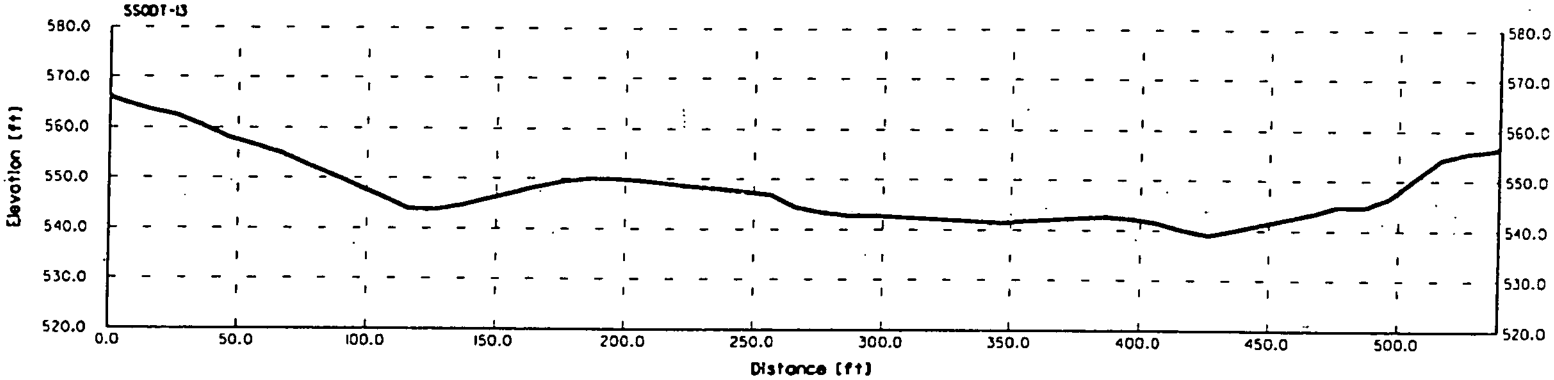
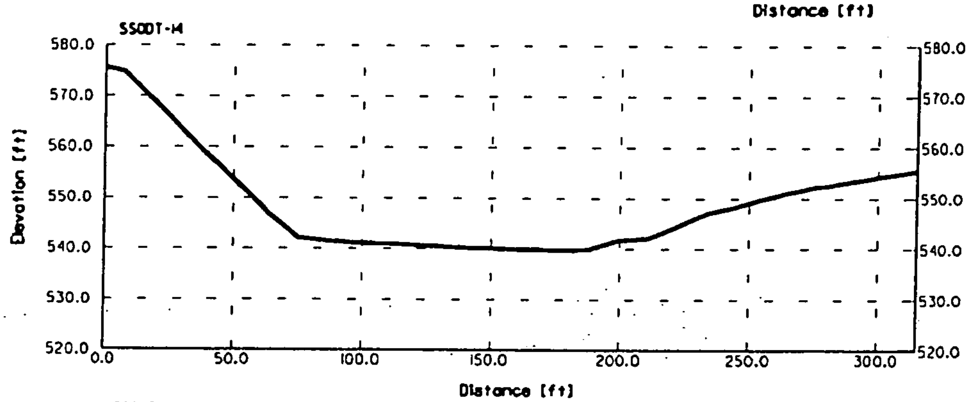
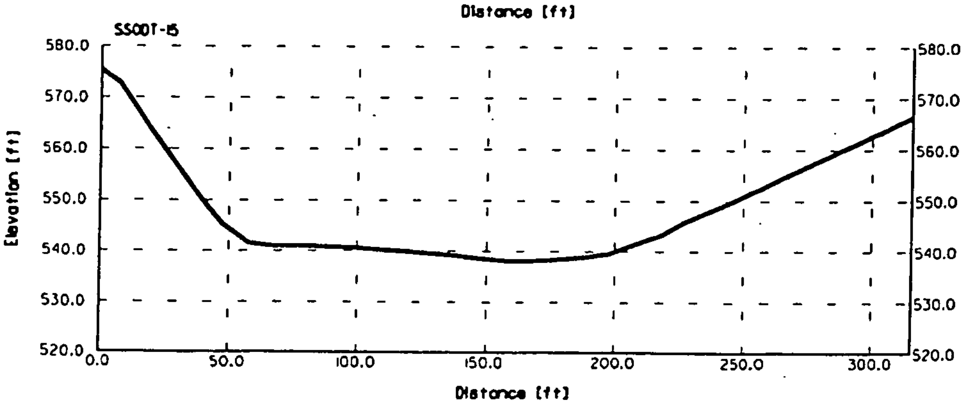
Distance (ft)


SSODT-13
Elevation (ft)
Distance (ft)


SSODT-14
Elevation (ft)
Distance (ft)


SSODT-15
Elevation (ft)
Distance (ft)

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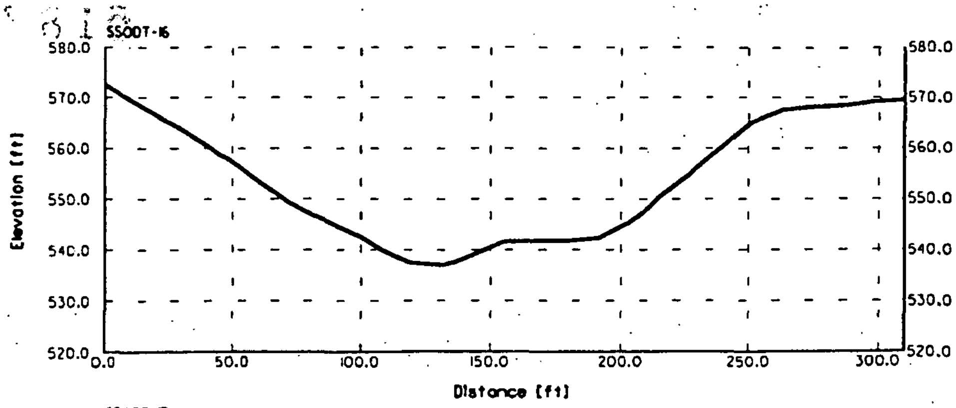
SSODT-16
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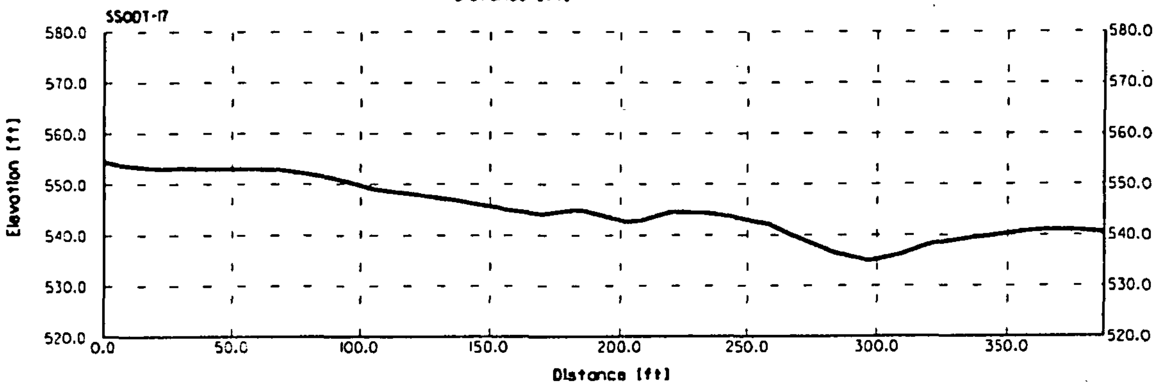
SSODT-17
Elevation (ft)
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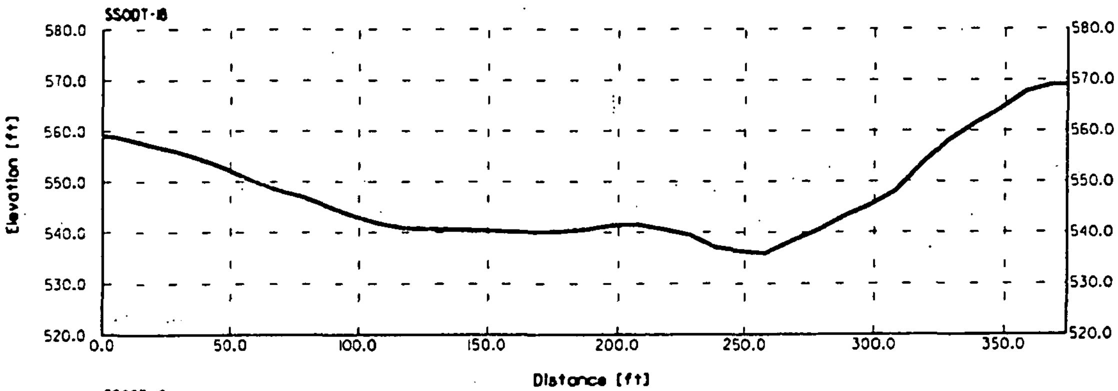
SSODT-18
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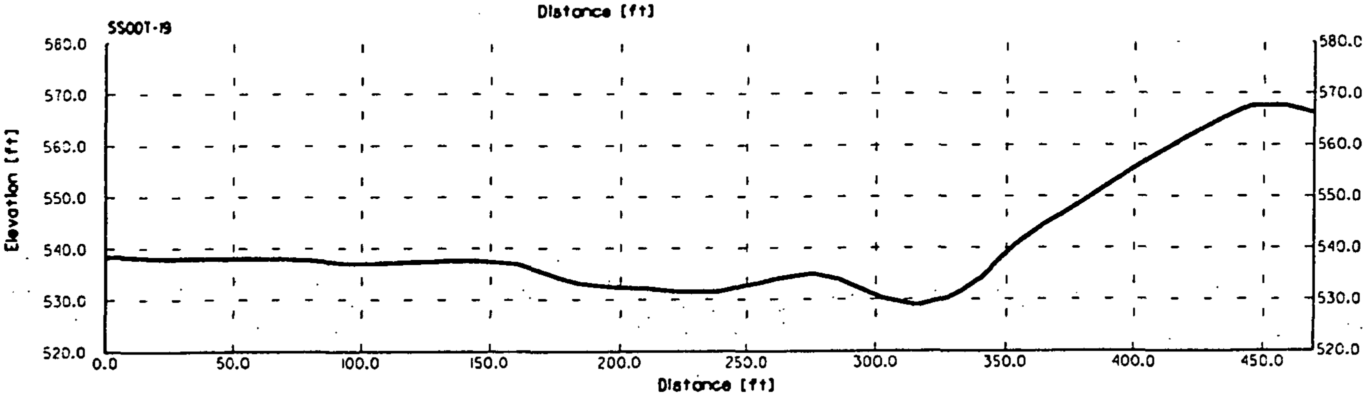
SSODT-19
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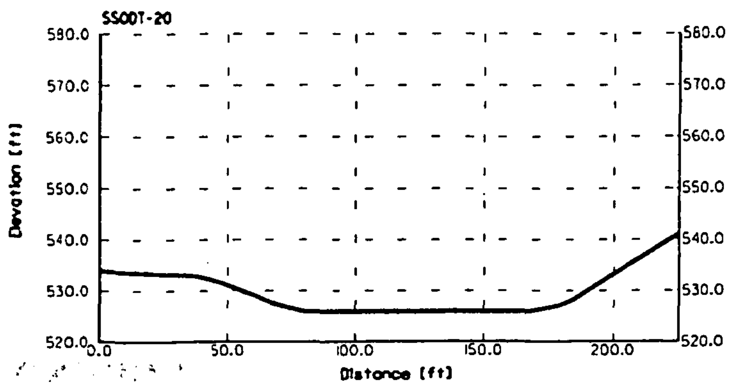
SSODT-20
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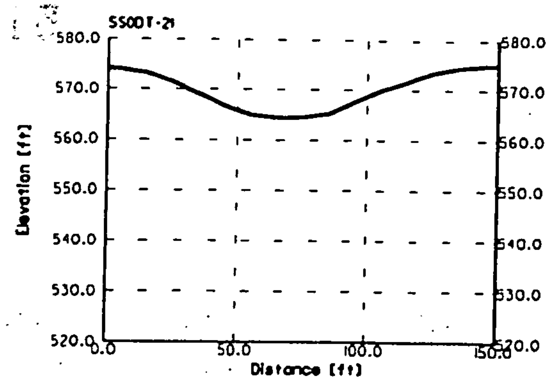
SSOOT-21
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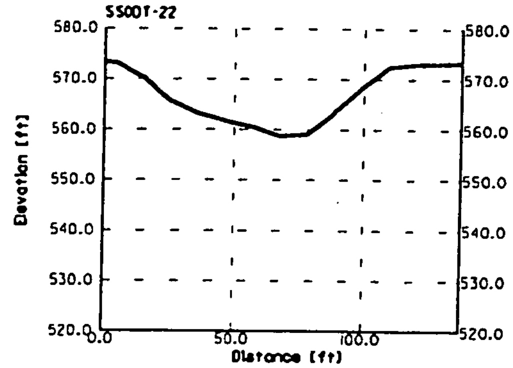
SSOOT-22
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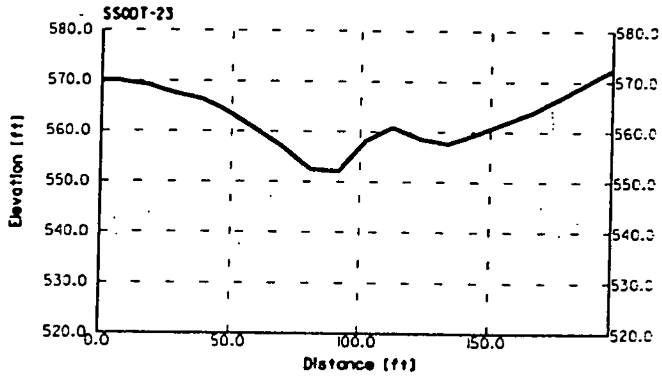
SSOOT-23
Elevation (ft)
Distance (ft)
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000080

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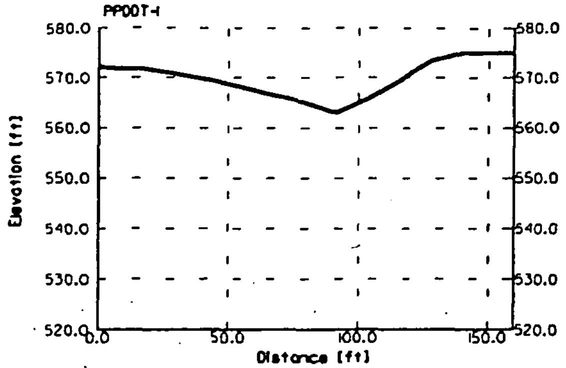
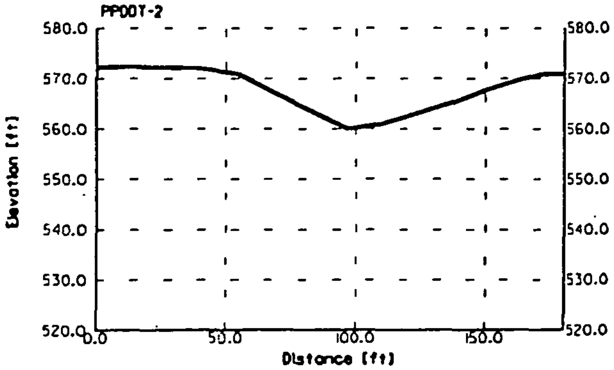
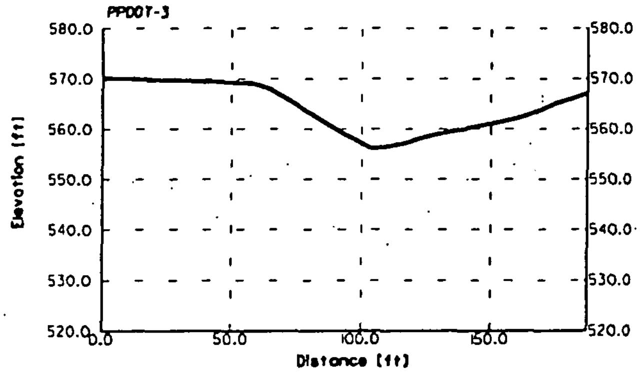

PPDOT-1
Elevation (ft)
Distance (ft)


PPDOT-2
Elevation (ft)
Distance (ft)


PPDOT-3
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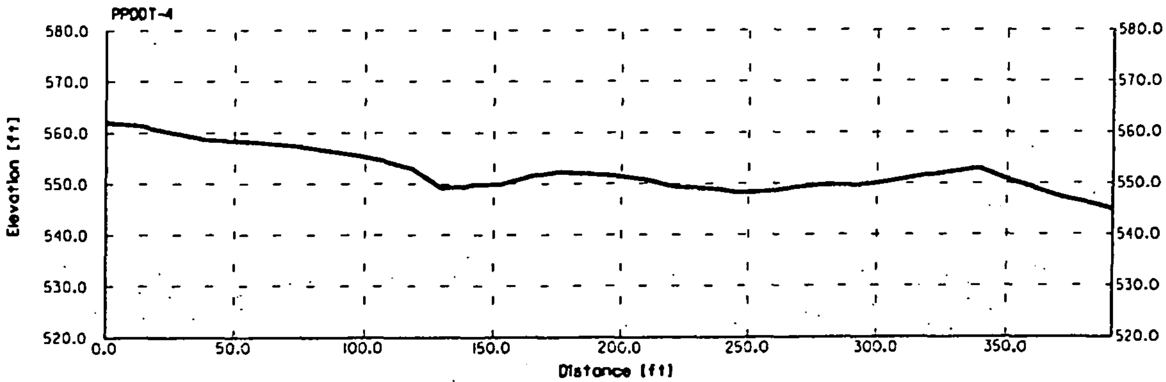
Distance (ft)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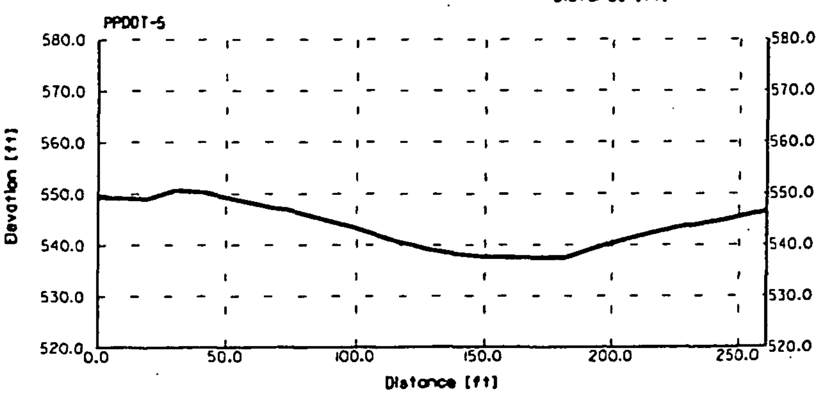
PPDOT-5
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Distance (ft)

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